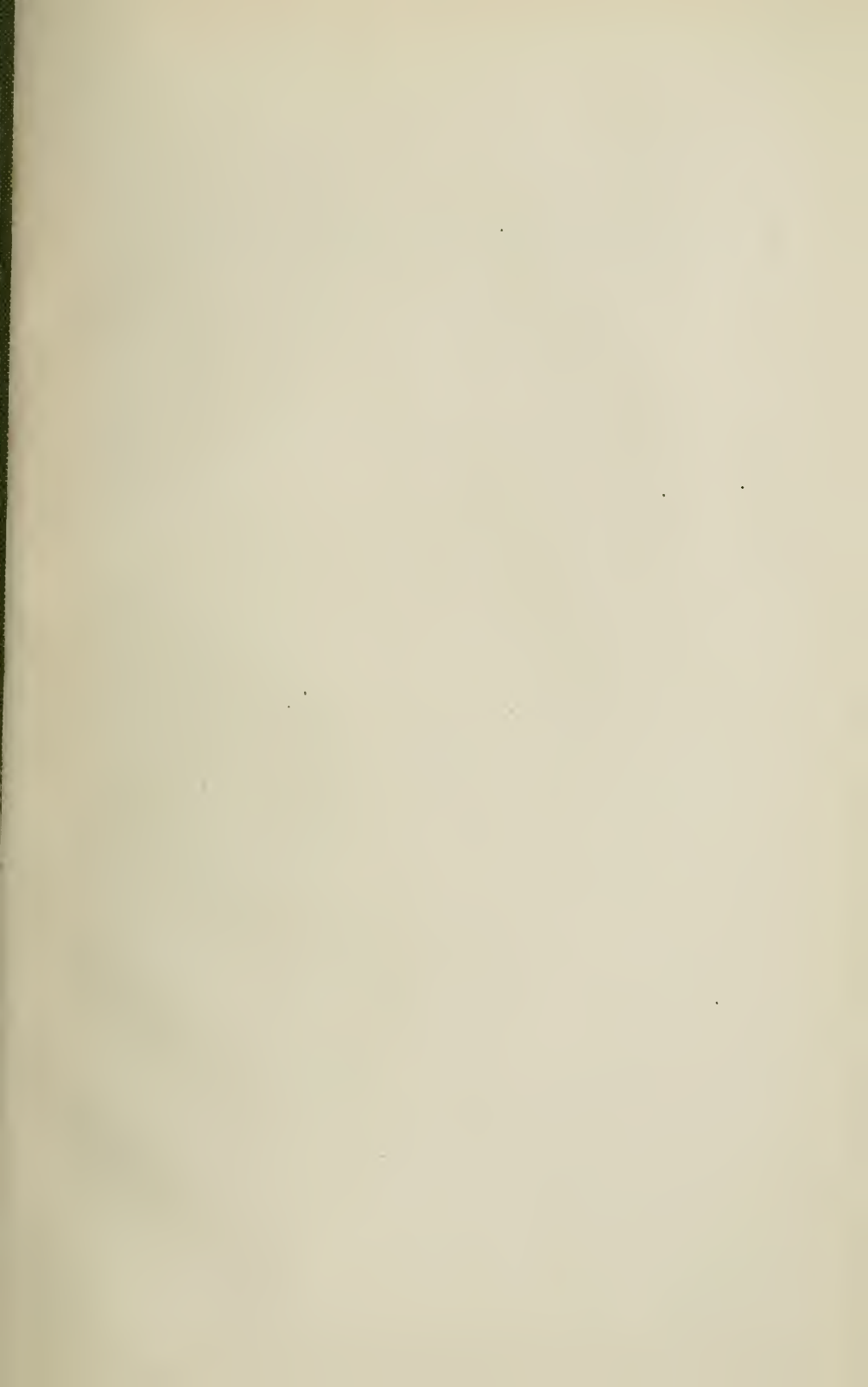


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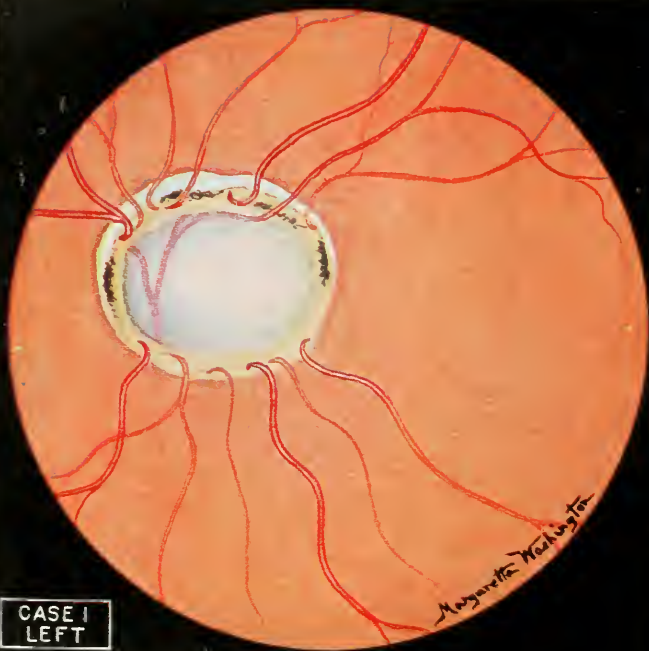
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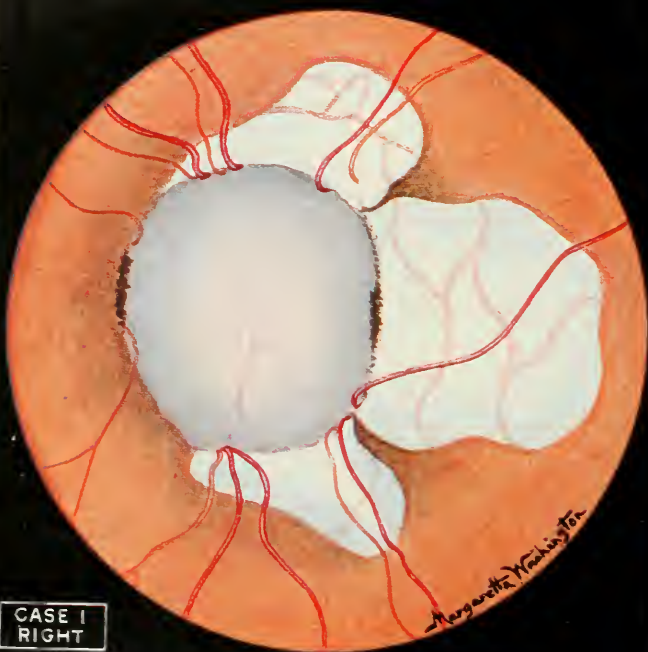
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CASE I
LEFT



CASE I
RIGHT

Binocular coloboma of the optic nerve.

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I.

THE DIAGNOSTIC AND THERAPEUTIC USES OF TUBERCULIN IN OCULAR DISEASES, WITH A REVIEW OF SOME OF THE CLAIMS MADE FOR IT.*

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NEW YORK.

GENERAL CONSIDERATIONS.

Of the great clinical value of tuberculin as a diagnostic and therapeutic aid in ocular diseases there is no longer any doubt, and it has come to be recognized and employed for both diagnostic and therapeutic purposes by a great many oculists in the last twelve years. Next to the great master himself, Koch, who found the bacillus and gave us the remedy, tuberculin, ophthalmologists are most indebted to von Hippel for his masterful work and great patience in restoring confidence in a thoroughly discredited remedy, especially as applied to ophthalmic practice. As Derby¹ aptly puts it: "It might be said that von Hippel was the father of modern tuberculin therapy in ophthalmology."

Koch's original idea was that the reaction was due to a tissue necrosis (the coagulation necrosis of Weigert), the tuber-

*Read before the Section on Ophthalmology of the American Medical Association, at Minneapolis, June 17, 1913.

culin having a selective action on the tuberculous tissue, causing it to slough, and this necrosed tissue gave rise to the reaction. He also supposed that the tubercle bacillus could not live in this necrosed tissue, and proceeding on this theory he gave large doses of the tuberculin in order to eradicate the diseased tissue and with it the infecting germ. With the disastrous results that followed this line of treatment we are, unhappily, only too familiar. Virchow, at the Pathological Institute at Berlin, and other investigators at that time, showed that what really took place following the injection of these large doses of tuberculin, under this mistaken idea of the way it reacted, was a dissemination of tubercle bacilli from the original focus of infection (pulmonary cases) into every tissue of the body, with, of course, rapidly fatal termination. When this was demonstrated, and, in the meantime, Koch announced that his remedy was toxic in nature, confidence in the remedy was all but entirely destroyed. A few investigators, however, continued to use it (Goetsch, Spengler, Ehrlich, Petruschky), but in small doses.

Ophthalmologists literally abandoned its use until 1900, there being but one recorded instance of its use, according to Derby,¹ between 1893 and 1900, and that was by Zimmermann in 1898, who used the new tuberculin (T. R.) on a patient who had lost one eye from tuberculosis, and saved the remaining eye. Derby also says: "This is also the first record of the use of T. R. in ophthalmology and, to the writer's knowledge, the first use of the mild dosage." Schieck and von Hippel later made methodical studies of ocular tuberculosis and its treatment with small doses of T. R., instituting a technic which has since been followed by many oculists. Since 1904, hundreds of cases of ocular tuberculosis have been reported, and with favorable results in the vast majority of the cases, in which tuberculin has been used.

TUBERCULIN REACTIONS.

As is well known, the diagnostic value of tuberculin depends on the reaction it produces when brought in contact with the living organism, either by dropping it on mucous surfaces, rubbing it on the skin, by vaccination into the skin, or injecting it into the skin or under the skin. Of the nature of this action, or rather reaction to tuberculin, some words of ex-

planation are here necessary, though space does not permit a full description of same.

Three factors are comprised in the tuberculin reaction:

1. General or constitutional reaction, which consists in a rise of temperature, a feeling of malaise, accompanied at times with vomiting, headache and eruptions on the body, the temperature changes being the most important symptom of the general reaction.

2. A local reaction, resulting in a nodule or infiltration at the site of the vaccination or injection, which may be slight or extensive and may cause enlargement of the neighboring glands.

3. A focal reaction, which consists of lighting up anew or increasing the inflammatory process at the site of the lesion.

Of these three factors in the tuberculin reaction, in ophthalmic cases, the focal reaction is the most reliable as an indication that tuberculosis is the cause of the eye trouble, though the primary focus of infection may not necessarily be in the eye itself.

The local reaction at the site of injection or vaccination comes next in importance, while the general or constitutional reaction, of which temperature is the chief indication, is the least important from a diagnostic point. The alteration of the temperature, a rise or a fall, is, however, the most important guide that we possess in administering the therapeutic injections of tuberculin; but of this one I shall speak later.

As to the cause, nature and specificity of the tuberculin reaction, there has been the greatest amount of discussion. Hamman and Wolman,² in their recent excellent book on "Tuberculin in Diagnosis and Treatment," have gone fully into this phase of the subject—in fact, into the whole subject of tuberculin diagnosis and treatment.

As to the specificity of the tuberculin reaction they assert that it has been settled in the affirmative, "to the satisfaction of almost every one." In the early experimental stages of the tuberculin reaction it was tried on animals, of course, and especially on cattle, to decide if they were tuberculous. So great was the number of positive reactions to the tuberculin test that the value of the test itself was questioned, as seemingly healthy animals reacted positively. The anatomic findings, however, corroborated the tests. The statistics of

Frankel, Voges, Kuhman, Bang and von Behring are cited by Hamman and Wolman; these statistics show that there was only about 2 or 3 per cent difference between the results of the tuberculin tests and of the autopsy findings.

"These investigations show that, apart from certain well recognized sources of error, the tuberculin test in cattle gives results in absolute accord with autopsy findings. The crucial point of the results, a point we shall not tire of repeating, is that tuberculin indicates infection and not disease in a clinical sense. Note that many, indeed most, of the reacting cattle were apparently healthy, and, if allowed to live, they remained healthy and did not develop symptoms of tuberculous disease, at autopsy showing inactive or regressing lesions."²

And just as the frequency of the positive reactions to tuberculin in cattle had led to doubts, as to their value at all, so in the human kind, when so many reacted to the tuberculin tests, even apparently healthy individuals, the value of the test was called into question. But here again the anatomic findings at autopsy confirmed the diagnosis in nearly every instance and demonstrated the fact that tuberculosis, especially of a latent kind, is present much more frequently than clinical manifestations would lead us to believe. Hamman and Wolman² cite the statistics of Schlenker, Nāgali, Burkhardt, Hamburger and others. Burkhardt's figures on the result of 1,452 postmortems showed:

"1. The increased frequency of tuberculous infection with advancing years, reaching over 90 per cent past the eighteenth year.

"2. The great fatality of tuberculosis during the first few years of life and its extreme death rate in early adult life.

"3. The steady and rapid rise with years in the frequency of latent active and particularly latent inactive tuberculosis."

And Hamburger's³ results of postmortems on 848 children, from newborn infants up to fourteen years, gave an average of 40 per cent who had been infected. The younger the child the fewer the infections. Up to three months of age only 4 per cent, with a steadily increasing ratio as age increased, until in the interim from eleven to fourteen years of age the percentage reached 70.

When the tuberculin test was first introduced it was noticed that children reacted positively less frequently than adults.

Schreiber tested forty newborn infants, and though he rapidly increased the dose up to 50 mg. he secured no positive reaction. He attributed this lack of reaction to tuberculin to the "active metabolism of the infants." Hamburger, in children who failed to react to the cutaneous test and had no local reaction after the subcutaneous test, rapidly increased the dose and at short intervals up to 500 mg. of tuberculin without producing a reaction. They did not react simply because they had no tuberculous infection or lesion. As age advances, however, tuberculous infections (as shown by autopsies) are much more frequent, and positive reactions are much more common. We see from the foregoing that the tuberculin test, with its characteristic reaction, is of the utmost value from a diagnostic point of view.

In arriving at a diagnosis, especially of latent tuberculous lesions, the reaction produced by it may be regarded as specific in indicating a tubercular infection, and a failure to react is, in itself, the strongest presumption that the subject is not infected. There are, however, some exceptions to this rule. As shown by experience, the reaction may fail to occur: (1) in acute and virulent tuberculous infections; (2) in the last stages of the general disease; (3) during the period of incubation of the disease; (4) during infectious diseases; (5) after a patient has been rendered immune by a course of tuberculin treatment which, in itself, is one of the most delicate tests we have that a "cure" has been made; (6) and, lastly, there are some cases, even with moderate infection, where no reaction occurs for which no satisfactory explanation is forthcoming.

In the acute advanced cases of tuberculosis the failure to react to the injections of tuberculin is supposed to be due to the fact that the patient's body cells are not in condition to produce the "antibodies" which are a necessary factor in the reaction process, and these are the unsuitable cases for tuberculin treatment.

THE NATURE OF THE TUBERCULIN REACTION.

The exact nature of the tuberculin reaction is not understood. Koch was led to use tuberculin as a remedy by his observations of the different manner in which injections of tuberculin affected healthy guinea pigs and those that had

been previously infected with tuberculosis. An open ulcer took place at the site of injection in each case; the ulcer in the uninfected or healthy pig remained open, however, until the death of the animal; but, in the previously infected animal, the ulcer healed up in a few days, even without the neighboring lymph nodes becoming enlarged. Koch was of the opinion from this that the toxic substance of the tubercle bacillus had a selective action on the tuberculous tissue present, and caused necrosis and sloughing, the reaction resulting from absorption and casting off of this necrotic tissue. This theory has been given up, however, and the reaction is considered as a true toxemia, the body cells resisting the toxic substance of the tubercle bacillus, with the result of temperature elevation and concomitant symptoms and, in the long run, of what is known as toxic or bacterial immunity. That is, the toxic substances of the tubercle bacillus, which are considered as proteins and are supposed to act as true antigens, stimulate the body cells to the formation of antibodies, which are protective against the further invasion of the special bacillus which has brought them into existence.

Matthes⁴ was of the opinion that the reaction was due to albumose intoxication. Again, the reaction to tuberculin and the hypersensitiveness it produces has been compared to the reaction following the injection of serum and the serum sickness (anaphylaxis), and both are considered due to the same cause—the proteins contained in them. In this connection Hamman and Wolman² say:

"Until contradictory evidence is forthcoming, if such evidence ever can be obtained, the conclusion is completely justified that all tuberculins, if active, owe their activity to the presence of the specific protein of the tubercle bacillus, whether this be in solution, in ultramicroscopic particles, in microscopic particles or in unaltered bacillary bodies.

"In its broad principles tuberculin hypersensitiveness unquestionably is closely related to the phenomenon of protein hypersensitiveness. The time of its development, after infection, the character of the reaction symptoms, its elevation following the administration of small amounts of tuberculin, all are significant points."

Wolff-Eisner⁵ has shown that tuberculins, whether from the filtrate or bacillary body, always produce essentially the

same effects, there being differences in the degree but never in the character of the reaction. Indeed, they act as living tubercle bacilli do, save that they are devoid of growth and reproduction.

In regard to the activity and quality of tuberculins, Hamman and Wolman² express the following opinion:

"The source of the tubercle bacilli from which the tuberculin is prepared is of the greatest importance. It has been generally known that different strains of tubercle bacilli produce widely varying tuberculins. The variation, however, is in the strength alone, the character of their efforts being invariably the same. So much has been claimed for difference in diagnostic and therapeutic effect between tuberculin from human and tuberculin from bovine tubercle bacilli that it is of the greatest importance to emphasize that this statement applies with equal justice to products from these two sources. Romer, after an extensive investigation of the effects of tuberculin from human, bovine, and fowl tubercle bacilli on animals (guinea pigs, cattle, chickens, and rabbits), infected with human, bovine and fowl tubercle bacilli, concludes that there is no essential difference in the character of the effects the three produce. Indeed, human and bovine tuberculin are so identical in their action on infected animals that we may neglect to ascertain their source. Their results are fully sustained in a recent publication by Weber and Dieterlen."

IMMUNITY.

And this brings me to speak very briefly of immunity conferred by tuberculin injections. As I have already stated, Koch's idea was that tuberculin brought about a cure by a necrosis process, that is, the tuberculous tissue was sloughed away by the action of the tuberculin and with it the germs of tuberculosis were thrown off. This idea of Koch has been abandoned and the theory of immunization by the repeated injection of bacterial poisons or toxins has been widely accepted as the method by which a cure is effected." This immunity, brought about by the repeated injections of tuberculin (the toxins of the tubercle bacillus), is regarded by some observers as a specific bacterial immunity, while by others simply a toxic immunity. The theory of immunity is based on the fact that the injections of tuberculin produce a sensitiveness or

rather a hypersensitiveness in the body, manifested by a rise of temperature, etc. And the correct interpretation of this hypersensitive condition or reaction, produced by the injections of tuberculin, is taken to mean that tuberculins act as true antigens and stimulate the body cells to produce antibodies, which antibodies destroy tubercle bacilli and in this way bring about a cure of the disease, tuberculosis.

The local hyperemia, produced at the site of the tuberculous lesion by the injection of tuberculins, is supposed to be an aiding factor in the cure.

If the body cells or tissues have been greatly weakened, as in advanced cases of tuberculosis or in very acute infections, or from other causes, and are not in condition to produce antibodies when the tuberculin is injected, no benefit is derived from the injections, and, as a matter of fact, great harm may be done the patient, by producing what is known as the "negative phase" of the reaction. It may be well to state, in passing, that, so far, neither in animals nor in man, have we been able to establish a complete or absolute immunity (protection) against tuberculosis. It is only relative or partial. While a lesion may be healed, and the resisting power of the individual to reinfection be greatly increased, it does not insure that the reinfection may not take place if the subject is exposed to a virulent infection. It should be stated also that spontaneous immunity to the disease may take place; that is, the patient may manufacture antibodies as the result of the secretions of toxins from the living tubercle germs with which he is infected and a cure result. Here again the resistance to future infection is greatly increased, and usually renders the subject immune to mild infections, but the immunity is not absolute and the subject may be reinfected by a virulent type of tubercle bacillus.

"It is important to emphasize that, while tuberculosis confers marked immunity to tuberculous infection, the original lesion may, and usually does, continue to progress."² Even this partial immunity, however, often prevents further spread of the disease from within the body and from new infection from without.

To animals the greatest immunity is conferred only by the injection of living virulent types of tubercle bacilli secured from warm-blooded animals (man, ox, etc.), the killed tuber-

cle bacilli not affording nearly so great protection as the living ones. Furthermore, as demonstrated by de Schweinitz and Trudeau and others, the living human cultures, if attenuated by prolonged cultivation, lose their virulence even for so susceptible an animal as the guinea pig, and, as a consequence, afford but little immunity when injected.

Trudeau,⁷ in 1905, with a view to testing the protection afforded by such attenuated tubercle germs (attenuated by prolonged culture), and at the same time also with a view of testing the protection afforded by tubercle bacilli which had been attenuated and made avirulent by passing through cold-blooded animals (frog, blindworm, etc.), made an experiment on guinea pigs with such germs. One set of guinea pigs he injected with twenty-year culture tubercle germs, another set with fourteen-year culture, another set with the culture that had passed through a frog, and another set with culture from a blindworm.

One month later all the guinea pigs were injected with virulent living tubercle germs. In addition some control animals were infected. The result was most interesting; the guinea pigs that had been previously injected with the immunizing dose of fourteen-year-old culture were slightly protected from the later injection of virulent germs; those injected with the twenty-year culture were less protected, while those that were injected with cultures from the frog and blindworm were not protected at all and died as quickly as did the control animals. One of Trudeau's conclusions drawn from the above experiment is "that cultures derived from cold-blooded animals and which grow only at room temperature, as used above, have brought about no appreciable degree of immunity."

Although these experiments were conducted on guinea pigs, the results are of particular interest just now, because of the recent introduction of an attenuated vaccine made of living tubercle germs which had passed through a cold-blooded animal, the turtle. Whether such attenuated vaccine of living tubercle bacilli will confer immunity, and whether it is a safe vaccine to use in the human subject, are points yet to be determined by clinical experience. The originator, Dr. Friedmann, claims that the vaccine confers marked immunity and that it is a safe remedy. Von Ruck⁸ questions both points

until they are proved by actual experience. As to the safety of these attenuated and so-called avirulent tubercle bacilli derived from a turtle, von Ruck asserts that "one or more passages of nonvirulent forms through susceptible animals is often ample to restore the virulence," and says further:

"In the case of a human culture which had continued avirulent for seven years during my observation, and which was avirulent when I received it, the virulence was reestablished after its recovery from a lymph gland in which no appreciable alterations beyond a certain degree of hyperplasia could be detected."

And in regard to injecting living tubercle germs into the human being, he says:

"Inasmuch as living tubercle bacilli of the human type have been found in vaccinated cattle, both in their tissues and in their milk, as long as three years after their intravenous injection, the objection to living tubercle bacilli, as an antigen or vaccine for prophylactic purposes in the human subject, is a valid one, and equally so for animals whose milk and flesh are used for human food."

In a recent communication⁹ S. G. Dixon claims to be able to produce a branched form of the tubercle bacillus by subjecting the culture medium on which they are growing to a temperature ranging from 52 to 56 C. He says:

"In the branched forms we have a reduced virulence and have produced a marked degree of immunity in lower animals with branched forms of the living bacilli. Apparently they have not been tried on the human being."

DIAGNOSIS.

For diagnostic purposes the old tuberculin of Koch is employed in several different ways, almost to the exclusion of all other tuberculins. The one exception to this is the washed precipitate of old tuberculin used by Calmette and others in the conjunctival tests. But even here many observers prefer the dilutions¹ (1 per cent, as a rule) of Koch's old tuberculin to the precipitated solutions (0.5 to 2 per cent) used by Calmette and his followers. As the Koch solution is weaker, it is safer and not so apt to cause excessive reactions as the stronger precipitated solutions.

1. The Subcutaneous Test.—All told, this is the best and

most reliable of the tuberculin tests. Before it is given, however, the patient's temperature should be taken four times a day for two days previous to the test. If there is found any considerable temperature elevation, it is best not to give the test until this has abated.

The indications of a positive reaction are:

1. Constitutional Symptoms: The chief of these is a rise in temperature which may, and often is, accompanied by a feeling of depression and malaise, chilly sensations, headache, aching pains in the back and, at times, nausea and vomiting, and eruptions on the body.

2. Local Symptoms: Redness and swelling at the site of the injection appear, sometimes accompanied by swelling of the nearby lymph nodes.

3. Focal Symptoms: In case of ocular tuberculosis, there is increased irritation and exudation at site of disease; pain, and flashes of light if the retina is involved.

As to the constitutional symptoms, it is desirable not to have intense reactions but only a very slight rise of temperature, and neither should there be produced but the slightest focal reaction in the eye, especially if acutely inflamed already, because great and permanent damage may be done if the lesion is in the retina or choroid, by the excessive inflammation produced.

The initial diagnostic dose of Koch's old tuberculin for injecting under the skin should not be greater than 0.5 mg. If a reaction takes place it will occur usually in from six to ten hours and reach its height in from twenty-four to forty-eight hours. If the first injection is not positive, after forty-eight hours, a second injection of 2 mg. may be given, and if this does not react in forty-eight hours, then a third injection of 5 mg. or 10 mg. may be given. If no reaction follows this is strong evidence that the ocular lesion is not of tuberculous origin. If a positive reaction takes place, especially if a focal reaction occurs in the eye, it is strong evidence that the ocular lesion is due to a tuberculous lesion, the primary tuberculous lesion not necessarily being in the eye, as a tuberculous lesion in some distal portion of the body, as is well known, may cause ocular disease.

Von Pirquet's Test.—This test consists in vaccinating the patient with old undiluted tuberculin. The arm is usually the

place selected. After cleansing with alcohol a small scarification is made, just sufficient to have a little oozing, but no bleeding. Then the tuberculin is rubbed into this spot and allowed to dry. A second scarification about one inch distant from this is made, simply as a control. The arm is protected with a light piece of sterile gauze held on by strips of adhesive plaster. At the end of from twenty-four to forty-eight hours, the reaction, if positive, is usually at its height. Three degrees of reaction are noted: (1) mild, where the skin at the site of the vaccination is reddened and slightly infiltrated for a distance of 5 or 6 mm. around the vaccination; (2) moderate, more redness and wider infiltration and slight elevation of skin, perhaps double that of the mild; (3) intense, where the redness and infiltration extends an inch from the vaccination, accompanied at times with vesicles and occasionally with enlargement of the neighboring lymph nodes. In two instances I have had, in addition, a constitutional reaction with rise of temperature, malaise, etc., and also a focal reaction in the eye. In one of these patients a Pirquet test had been made twelve days previously with a 25 per cent solution of old tuberculin, with a negative result. I may say that the subcutaneous diagnostic test confirmed the diagnosis in these two cases, and that therapeutic injections cured the patients of their ocular lesion, one a keratitis, the other a choroiditis.

A positive Pirquet test in young children is of value as indicating the presence of a tuberculous lesion somewhere in the body; in older children it is of doubtful value, and in adults it cannot be depended on. When the Pirquet test is negative, however, especially when repeated a second time, it is practically certain that there is no tuberculous infection anywhere in the body.

Moro's Test.—This is somewhat similar to Pirquet's test—in fact, it is a modification of it. A 60 per cent ointment of old tuberculin (the base being lanolin) is used to make the test. A piece the size of a pea is thoroughly rubbed into the skin covering a space of from one to two inches in diameter. If positive, in from twenty-four to forty-eight hours, small papules appear at the site of application of the ointment, more or less numerous according to intensity of reaction. The test is variable and not very reliable.

Calmette's Conjunctival Test.—This test consists in putting

a drop of a 1 per cent solution of the old tuberculin into the lower cul-de-sac, or a precipitated solution of the old tuberculin is sometimes used in 0.5 to 2 per cent solutions. The reaction consists in a more or less severe conjunctivitis, according to the intensity of the reaction, which reaches its height after from twenty-four to forty-eight hours. This test should never be applied to an eye that is the least inflamed, or that has had a serious inflammation, as at times it causes severe conjunctivitis, keratitis and ulceration of the cornea, with permanent impairment of vision. In fact, it has been known to injure a hitherto healthy eye. For this reason it should have little or no use in ophthalmic practice. In a series of over six thousand cases Calmette himself has had some severe reactions from its use, but says no eye has ever had a permanent injury, nor has the sight been reduced permanently in a single instance. But, even were it a safe test, it causes a reaction in so many cases that a positive test is without much significance. When negative it is of more value, as excluding tuberculous infection of the body.

The conjunctival test has the further disadvantage of often rendering the eye into which it has been instilled hypersensitive to subsequent injections of tuberculin used for therapeutic purposes, each injection causing the eye to become inflamed, so much so that sometimes therapeutic injections must be stopped on account of the irritation produced in the eye.

The Intracutaneous Tuberculin Test.—Here the tuberculin is injected into the layers of the skin (infiltration); this is a very delicate test as to tuberculous infection, as is also the subcutaneous local or depot test. But both of these tests are positive so often, especially in adult life, that they are not of value for diagnostic purposes.

My own method of procedure in a suspected case of ocular tuberculosis is to first make the Pirquet test with the undiluted old tuberculin of Koch. If the test proves negative, it practically excludes tuberculosis as a cause. If still in doubt, however, the test is repeated in three or four days' time. If again negative, tuberculosis is excluded as a cause of the ocular trouble. If the Pirquet test is positive, unless in a very young child, the test is supplemented by the subcutaneous test, 0.5 mg. of old tuberculin, being given. If this is negative, a second injection of 2 mg. is given; if this is nega-

tive still, a third injection of 5 mg. is given. This proving negative, tuberculosis may be excluded as a cause.

When the subcutaneous test proves positive, especially if a focal reaction takes place, we may decide definitely that the ocular trouble is of tuberculous origin, and proceed with therapeutic injections.

THERAPEUTIC USES OF TUBERCULIN.

Many different preparations of tuberculin have been devised for the treatment of tuberculous diseases. These preparations may be made either from the human or bovine type of tubercle bacillus. Although many preparations have been made and their use advocated on the supposition of some superior quality or potency not possessed by the others, but few have survived the test of clinical experience, which, after all, is the crucible that eliminates the unfit.

Koch's old tuberculin, "the first tuberculin in point of time, is still the first in importance in the diagnosis of tuberculosis, and in treatment, too, it may be regarded as among the most useful, if not the most useful."² And I may say that there are many other observers of the same opinion. Verhoeff,¹⁰ in a discussion on this subject in 1910, says:

"In regard to the question of the kinds of tuberculin used, I think it would be unwise to abandon old tuberculin until we have some evidence that the newer vaccines are superior. I have obtained such good results with it that I should be loath to take up other tuberculins simply because they are new."

And Leber¹¹ has spoken in favor of old tuberculin for therapeutic injections, preferring it to the newer preparations because of its more uniform action, and because it is not so apt to cause excessive focal reactions.

Koch's Tuberculins.—Koch's old tuberculin (O. T.), as is well known, is a concentrated filtrate of tubercle bacilli reduced to one-tenth of its original volume and contains presumably only the soluble toxins (exotoxins) of the germs, and not the insoluble toxins (endotoxins) contained in the body of the bacillus itself. The exotoxins or secretions of the tubercle bacillus are supposed to exert marked immunizing power by stimulating the body cells to the formation of antibodies, but not to possess antibacterial properties, as do the endotoxins; so later it was conceived by Koch that a vaccine which con-

tained both immunizing and bacteriolytic properties would best fulfill the requirements of an effective vaccine against tuberculosis. Accordingly, Koch brought out his newer preparations, "T. R." (1897) and "B. E." (1901), the latter being an emulsion which contained not only the exotoxins but the endotoxins. Furthermore, as no heat is used in making them, their activity is not lessened, as supposed to be the case in the manufacture of O. T. where heat is employed.

Denys' Bouillon Filtrate.—Denys, in 1905, brought out his bouillon filtrate (B. F.), a preparation somewhat similar to the O. T. of Koch, except that it is not heated or concentrated. It contains the soluble secretions (exotoxins) of tubercle bacilli and the proteids which go into solution in the culture fluid through metabolism, but none of the insoluble proteids or toxins (endotoxins) which remain in the bodies of the bacilli, which latter have been removed by filtration.

Beraneck's Tuberculin.—Beraneck, in 1903, made a vaccine from a filtrate derived from a toxic bouillon, mixed in equal volume with toxins extracted from tubercle bacilli, by means of orthophosphoric acid. It is known as Beraneck's Tuberculin. (T. B. K.) He claims for it high immunizing properties and only a mild toxicity. It is furnished to the profession in a great number of dilutions, each succeeding dilution being double the strength of the one immediately preceding.

Asparagin Tuberculin.—This is a preparation brought out by R. Löwenstein of Berlin, which is supposed to be free from albumins and on this account less toxic than the other varieties of vaccines. It is on trial. Tuberculins of a similar nature are the tuberculocidin, tuberculol, and endotin or Möller's tuberculin, the latter having many strong adherents.

Von Ruck's Watery Extract.—In 1897, von Ruck gave out his formula for a watery extract of tuberculin, which contained the endotoxins of the tubercle bacillus freed from the bacillary residue in solution. In the treatment of general tuberculosis, especially, this has been a popular tuberculin in America.

I would refer those further interested in the different varieties of tuberculin preparations and their method of manufacture to Hamman and Wolman's book,² where the subject is treated at length. But whatever the nature or derivation

of the tuberculin (antigen), it is not of so much importance in treatment, von Ruck claims, as is the method of its administration, the size of the dose given and the regulation of the intervals between doses. Of the tuberculins in this country, used in the treatment of ocular diseases, Koch's old tuberculin (O. T.), new tuberculin (T. R.) and bacillary emulsion (B. E.) are most in use. Of these I prefer B. E. above the others, and it is the one with which I have the most experience.

As to the methods of administration of tuberculin in the treatment of ocular diseases, I may say there are two schools of therapists. The first consists of those who wish to avoid reactions, especially of a focal nature, and following Wright's lead, they give extremely small doses of tuberculin, for example, T. R. or B. E., the initial dose being 1/80,000 or 1/10,000 mg., increasing the size of the dose very slowly, while the interval between doses is wide, from ten to twelve days, and the treatment is prolonged over a long period of time. The second school, consisting of those who wish to produce mild reactions, following the von Hippel method, begin with larger doses of T. R. or B. E., the initial dose being 1/500 mg., which is increased in size rather rapidly, 1/500 mg. each dose, and the doses are given at intervals of from two to five days until as much as 1 or 2 mg. may be given at a single dose, care being taken, however, not to cause too great a reaction; for example, not to raise the temperature more than 0.5 to 1 degree F. above normal, or to cause more than the mildest focal reaction in the eye, because a severe reaction in the eye may cause a lasting injury to the vision.

When the dose has been increased to the point of producing reaction, it should be held at this till the reactions cease, then gradually increased again, with slightly longer intervals between doses, till slight reactions are again produced, then repeat the procedure as before. This method is followed until the reactions cease or the patient is cured. The temperature is the most important guide we have in regulating the course of the treatment: this, together with the general condition of the patient, whether he is made to feel stronger and more cheerful, or is depressed (put in the "negative phase," so to speak), and a close observation as to any focal reaction, gives us all the evidence we need by which to proceed. The complicated "opsonic index" tests, as a guide to the regulation of

the treatment, have almost been abandoned. They are of great value, however, in differential diagnosis.

As to the two methods of treatment—no reactions or reactions—I prefer to give large enough doses to cause mild reactions, believing that I get quicker and better results in this way.

Hamman and Wolman,² speaking on this point, say:

"We have it within our power to raise or reduce the sensitiveness of an individual for tuberculin. Which shall we attempt? All things considered, an active reaction to tuberculin is certainly an indication of successful response to the infection and of the development of a high grade of immunity to reinfection."

But whichever method is pursued, it should ever be borne in mind to watch the general condition of the patient, how he reacts to the treatment, and to regulate the size of the dose and intervals between the doses to suit each individual case, and to abandon the tuberculin treatment altogether if the patient does not stand the treatment well, as sometimes happens when there are pulmonary complications.

CLINICAL RESULTS.

Conjunctivitis.—The literature on the clinical results of tuberculin diagnosis and treatment is so vast that even a citation of the numerous papers cannot be included here. I shall content myself, therefore, with the citation of such papers and case reports from the literature, together with some case histories from my own practice, as seem most pertinent to the subject.

The conjunctiva, palpebral and ocular, may be primarily affected by the tubercle bacillus; or secondarily, that is, (1) by the transmission of the tubercle germ itself from some focus in the body (which, according to Eyre,¹² is extremely rare); and (2) by the toxins from the tubercle bacillus situated in some other part of the body. The primary forms of conjunctivitis are relatively rare, while the secondary forms are exceedingly common, that is, if phlyctenular conjunctivitis is counted as of tuberculous origin, of which point I shall have occasion to speak presently. Eyre,¹² in his Hunterian lecture on tuberculosis of the conjunctiva, has given a valuable summary of the subject. While the clinical manifestations

may be many, he groups the different forms of ocular tuberculosis into five clinical types:

Group 1. Ulceration.

Group 2. Miliary tubercle.

Group 3. Hypertrophic granulation.

Group 4. Lupus.

Group 5. Pedunculated tumor.

He noted that the disease was more apt to affect young individuals than those advanced in age, and is of the opinion that it is practically always primary in nature, though some cases have been reported in which tubercle bacillus was said to be transmitted through the blood.

As to the method of the direct inoculation of the conjunctiva, especially in Groups 1, 2 and 4, he says it may take place possibly "(1) between the interstices of the epithelial cells of an apparently normal conjunctiva; (2) into a broken-down phlyctenule; (3) into an occluded or possibly a ruptured meibomian gland, and (4) into some abrasion or other slight trauma."

As to the treatment in these cases, Eyre advises surgical aid in addition to other treatment and advocates the complete removal of the local lesion, if that can be done without risk of subsequent scarring and disfigurement or of injury to the globe in cases coming under Groups 2 and 4. Also in Groups 1 and 3 any scraping and cutting that will remove any considerable portion of the diseased tissue without involving similar risks should certainly be carried out, but I strongly advocate, in addition, the administration of Koch's tuberculin T. R. Carefully administered by the careful observer, the conjunctival lesions become absorbed; indeed, they may be said almost to melt away, and the conjunctiva returns to its original normal condition.

Eyre reports eleven cases from his own practice, three of lupus: one of the lupus patients was completely cured, one was not benefited in the least, and the third has just come under observation. Of the remaining eight patients all were completely cured after periods of treatment varying from four to fourteen months. Koch's T. R. tuberculin was used in most of the cases, the initial doses being as low as 1/20,000 mg.; in some cases, the maximum dose reached was not higher than 1/2,000 mg., with intervals between doses ranging from

seven days to three weeks. Both from a diagnostic and from a therapeutic point of view tuberculin proved of great value in these cases.

Derby¹ states that "it is generally recognized that conjunctival tuberculosis is most resistant to tuberculin injections. Perhaps we may explain this by assuming that in the conjunctiva the disease is usually primary." Dor suggests that the prolonged healing may be due to secondary infections, as it is an open form of tubercle.

Phlyctenular Conjunctivitis.—Although about 90 per cent of such cases respond positively to the von Pirquet test for tuberculosis and are healed by therapeutic injections of tuberculin, there are a number of surgeons who deny that it is of tuberculous origin. Eyre,¹² whom I have just cited, does not regard it as a tuberculous affection, and states that until tubercle bacilli are demonstrated in the phlyctenules, he will not accept it as such. He thinks that local irritation is often responsible for the phlyctenules, and even that errors of refraction may be considered as a factor. George Mackay,¹³ while recognizing that this disease (phlyctenular conjunctivitis), is often associated with tuberculous infection of the lymph nodes, bones, skin or viscera, still has some diffidence in pronouncing a phlyctenule as a manifestation of pure tuberculosis, or of yet saying exactly to what its origin is due. He further says: "I would not regard them as a hallmark of tuberculosis. I would rather say that in the human mansion they constitute a sign 'Apartments to let for tubercle.'"

Colombo¹⁴ is another who does not believe in the tubercular theory of phlyctenular conjunctivitis, but contends that all cases of phlyctenular ophthalmia have their underlying cause in intestinal autointoxication. He depends on the indican in the urine to decide if autointoxication is present. In 115 cases he found indican present in large and moderate amount in 82.6 per cent of the cases, and absent or only a trace in 17.4 per cent.

H. D. Bruns¹⁵ of New Orleans thinks the disease a nervous manifestation resulting from intestinal autointoxication. And there are many others who believe in the autointoxication theory of phlyctenular ophthalmia.

But, opposed to all this array of authority, the positive reaction to the Pirquet test, confirmed most of the time by the

subcutaneous test and by the therapeutic injections of tuberculin, indicates that the disease has a tubercular origin. Rubert¹⁶ in a recent article cites Leber, Rosenbach, Weekers, Axenfeld and others, and is himself of the opinion that phlyctenular ophthalmia is the result of tuberculous infection in some part of the body; and they are of the further opinion that it is the toxins of the bacillus that cause the phlyctenules. Some external local stimulant is necessary as a rule to bring out the phlyctenules. Microorganisms of various kinds, as staphylococci, or the toxins of staphylococci, may bring out the phlyctenules, or even injuries or chemical irritants.

Such are the contrasted opinions of the various clinicians, and it must be admitted that, to the beginner at least, the situation is somewhat confusing. But let the etiology of the trouble be what it may, the correct treatment, in my opinion, is by the injections of tuberculin, the B. E. mixture being as good as any, if not the best preparation for the purpose. The general condition of the patient should be looked after, the diet regulated and, when necessary, even local treatment applied, along with the tuberculin injections. In other words, it should always be remembered that tuberculin acts best when the body cells are best prepared to manufacture the antibodies which are to protect the patient from further infection and to cure the present malady. Of course in many of the lighter cases phlyctenular ophthalmia heals of itself if the patient is placed in the proper hygienic surroundings; so, for that matter, do many cases of incipient phthisis; but in obstinate cases special aid must be brought to bear, and there is none equal to the injections of tuberculin.

Alexander¹⁷ of San Francisco and a number of other surgeons have pointed out the necessity, in these cases of phlyctenular ophthalmia, of removing enlarged tonsils, adenoids and enlarged caseous cervical lymph nodes when present, if we are to have a speedy cure. In fact, in some cases, not only of phlyctenules, but also of keratitis, iridocyclitis, etc., tonsils and enlarged caseous cervical lymph nodes, if present, must be removed in order to obtain a cure at all. The injections should not be discontinued too soon after the phlyctenules heal, as a recurrence is likely to take place.

In 1912, Vaughan and I reported¹⁸ forty cases of phlyctenular conjunctivitis in which we used the injection of B. E.

tuberculin with excellent results, and since then I have had a large number of such cases under the same treatment with equally good results, the percentage of cures being larger and quicker than by the old methods of treatment, and such I believe to be the experience of most clinicians who have used the tuberculin injections.

Tivnen¹⁹ reports fifty cases with 64 per cent cures, 24 per cent improved, and Herrenschand²⁰ reports the results of 105 cases of obstinate phlyctenular conjunctivitis treated with tuberculin (assisted by local treatment, salt baths and regulation of diet), in 103 of which rapid healing followed with also great improvement of the general condition. In only two of the 105 cases was the treatment unsatisfactory and in these the cervical lymph nodes were swollen as large as a fist. It may well be surmised that had these enlarged lymph nodes been removed surgically the results would have been more favorable in these two cases.

Parinaud's Conjunctivitis.—This affection of the conjunctiva was first described by Parinaud in 1899. Although its clinical aspects greatly resemble a tuberculous conjunctivitis, it was not thought to be of tuberculous origin until lately.

Meisner²¹ reports a marked case which reacted to 0.5 mg. of old tuberculin, and tuberculous iritis was produced in a rabbit by the injection of some of the infective material from the enlarged preauricular lymph node. Meisner cites two cases reported by Kruckmann which were tubercular in nature, and he also cites Wessely, who infected an ape with tuberculosis from the infectious material secured from a case of Parinaud's conjunctivitis, thus definitely establishing the disease as tubercular in nature. Krauss and Boyle²² also report a case of Parinaud's conjunctivitis which reacted strongly to a Pirquet test. Here, again, tuberculin has aided in establishing the etiology of a little understood disease, and, since the affection has been proved of tubercular origin, the therapeutic injections of tuberculin likely will prove of benefit in the treatment.

Scleritis, Episcleritis, Sclerokeratitis and Keratitis.—In this class of cases, especially when attended with nodular formation, tuberculosis has come to be recognized as the cause. Verhoeff²³ of Boston has demonstrated this fact both histologically and by the tuberculin reactions, in every case obtain-

ing a general reaction, and in most cases a local (focal) reaction. In the cases in which he failed to get a focal reaction in the eye by the diagnostic injection, "It could practically always be obtained later if treatment with old tuberculin was carried out with this end in view." And Verhoeff²⁴ recommends, in treatment of ocular tuberculosis, that focal reaction should be produced, provided sufficiently long intervals are allowed to elapse between them, if we are to obtain the best results, and he prefers the old tuberculin for treatment. Good results, however, are obtained where no focal reactions are brought about by the therapeutic injections, and Weeks²⁵ asserts that "it is not at all necessary to produce local (focal) manifestations in order to produce a favorable effect on the disease." In the preceding class of cases, scleritis and keratitis, very favorable results have been obtained by both methods of treatment and by the use of both the old and the new tuberculins. In fact, there have been some remarkable results reported.

De Schweinitz²⁶ reported a case of sclerokeratitis of eight years' standing that was cured by ten weeks' treatment with old tuberculin. He reported a second case which showed some improvement, then relapsed.

Verhoeff, Weeks, Derby and others, in this country, have reported several cases of scleritis, episcleritis and keratitis treated with tuberculins, and in most instances with good results, although there are some cases of failure reported.

One case of sclerokeratitis with a marked thickening of the conjunctiva of the upper lid, resembling very closely Parinaud's conjunctivitis, which occurred in my practice, is worth reporting because of two features, (1) the intensity of the reaction from the Pirquet test, and (2) the rapidity of cure.

Case 1.—A. C., a young colored woman (about thirty years old) was seen first September 13, 1912; not robust, though she has never been seriously ill. She went on a boat excursion two days before she consulted me, and waked up the next day with left eye red and painful and with poor vision. Examination showed right eye normal and with vision 20/20. Left eye had punctate opacities on the cornea, deep anterior chambers and circumcorneal injection; vision 20/200. Atropin and an iodine preparation and hot fomentations were ordered, and in ten days' time the acute inflammation had completely

subsided, though some faint opacities remained in the cornea. December 20, 1912, I saw the patient again, who said her eye had remained well until about December 6th, when it again, without apparent cause, became red, painful and the vision much reduced. She went to an eye hospital, where a Wassermann test was made and later a Pirquet test with 25 per cent old tuberculin, but both were negative. When I examined her eye (left) I found the upper lid swollen and edematous and the conjunctiva thickened as in Parinaud's conjunctivitis, small ulcer on superior nasal quadrant of cornea and two yellowish infiltrates in the lower half of the cornea about 2 mm. in diameter, and the whole limbus was surrounded by small elevations, there was itching and photophobia. Vision equaled hand movements. The tonsils were enlarged and also the lymphatics on left side of the neck. Father died of consumption. I ordered atropin, argyrol, and protiodid of mercury.

December 29th: patient's condition was worse. I gave Pirquet test with undiluted old tuberculin. A severe reaction followed, general, local and focal. The lymph nodes in the armpit became enlarged, and an infiltrated spot about one and one-half inches in diameter appeared at the site of vaccination on the arm. On the day following test, the patient was feverish, then chilly and a feeling of great malaise ensued; eight hours after the test the eye became flushed, painful and the pain extended into the temple and was so severe the patient could not sleep the night following. In forty-eight hours two new spots of infiltration appeared in the cornea, but all pain had gone from the eye. Six days following the test, when the eye had greatly improved, 1/10,000 mg. of B. E. was given. This was followed by focal and general reactions, but not so severe as after the Pirquet test. Another injection of B. E. 1/5,000 mg. was given four days later and another of 1/2,500, and a cure was effected in six weeks' treatment. The ulcer on the cornea had completely healed, the infiltration absorbed with some slight opacities remaining, and the lids about normal, though the conjunctiva was still somewhat thickened on the upper lid and "extremely itchy."

In cases of interstitial keratitis Mackay²⁷ lays great emphasis on the importance of tuberculin as a diagnostic test, and in those cases in which the diagnosis is doubtful and the Wassermann negative, he always uses, when the test is positive,

therapeutic injections of tuberculin. Mackay, in cases of ulcerative keratitis and conjunctivitis, advises the use of phagocytic index tests where they can be made, to ascertain if the trouble is a mixed infection, that the treatment may be regulated by it.

Iritis, Keratoiritis, Iridocyclitis.—In tuberculous iritis the therapeutic injections of tuberculin have yielded its most uniform and brilliant results. C. W. G. Bryan²⁸ thinks it is because it has a good blood supply. Von Hippel,²⁹ whose experience is very great, has reported twenty-three cases of tuberculous iritis cured by tuberculin, and many other oculists have reported most favorable results from the tuberculin treatment in such cases. Also the cases of keratoiritis and iridocyclitis have, in most instances, been favorably influenced by tuberculin treatment, cures being obtained in many, but in some failures are recorded. Mackay states that he has had gratifying experiences in the use of tuberculin in cases of iridocyclitis with punctate keratitis.

The following case of keratoiritis in my practice was unfavorably influenced by the tuberculin treatment, I believe, because of enlarged cervical lymph nodes, which the patient refused to have removed surgically.

Case 2.—March 24, 1911, Mrs. M. K., aged twenty-three, tuberculous history. Dullness at apices of each lung and very greatly enlarged cervical glands. No active symptoms. Weight 113 pounds. Right eye amblyopic as result of squint when child, no lesions. V. = 15/200 with correction. Left eye, V. = 20/30 — with correction. Cornea has seven grayish white punctate opacities in it the size of a pinhead, and Descemet's membrane is covered with dustlike opacities and there are fine opacities in vitreous, but no lesion of retina or choroid can be detected. There are some posterior synechiæ of iris.

Patient was sent to hospital. Temperature taken for two days proved to be normal. Gave 0.5 mg. of old tuberculin to confirm diagnosis. A most intense reaction followed—general, local and focal, temperature up to 104 F., intense headache, nausea, vomiting, and muscular weakness and prostration that confined patient to bed for two days. Eye became red and painful, but this quieted down again in two or three days. Atropin and hot fomentations were used locally.

After a week, when temperature was normal, therapeutic injections of old tuberculin were begun, initial dose 1/1,000 mg., which was increased 1/1,000 mg. a dose, at week intervals, until 1/100 mg. was reached, which caused a slight focal reaction. After two weeks, 1/50 mg. was reached, which caused a slight focal reaction; two weeks later 1/50 mg. weekly, at which dose she was held till June 15. Occasionally, there was a slight focal reaction, and a slight rise of temperature, 0.2 to 0.5 F. These injections were continued (with a lapse of two months in the treatment), until November 1, the largest dose of O. T. being 1/3 mg.

Although the patient had gained in weight (13 pounds) and looked and felt better, the vision was reduced to perception of light, due to opacities in the cornea and the partial blocking of the pupil. The eye was quiet, but the cervical lymph nodes remained much enlarged. A change to the B. E. mixture was now resorted to, initial dose 2 mm. of Vial 1 of H. K. Mulford preparation equals 1/10,000 mg. This was increased 2 mm. a dose at weekly intervals until 10 mm. of Vial 5 was reached, which equals 5 mg. This was February 5, 1912, and at no time was a focal or general reaction produced by the B. E. mixture.

Vision in left eye equaled counting fingers at 4 feet. Eye quiet, but cornea decidedly opaque. Tension normal. General condition splendid.

I am satisfied that the very much enlarged cervical lymph nodes in this case exercised a bad influence on the treatment. Incidentally, it is pleasant to note in this case that the vision in the amblyopic right eye (due to squint) increased from 15/200 to 20/30 (with identically the same correction) in the course of ten and one-half months' time, so though the patient lost the vision in one eye she regained it in the other.

Cyclitis.—In this tuberculin has been of great importance in arriving at a differential diagnosis, and there have been a number of favorable reports from tuberculin treatment. Leboucq,³⁰ however, reports five cases, with the typical descemetitis present in such cases, and states that tuberculin treatment has but little or no effect in such cases. Dor,³¹ on the other hand, claims that such cases, that is, cases of descemetitis with iridic uveitis, are very favorably influenced by tuberculin treatment. Dor now favors the use of B. E. mixture

for therapeutic uses, although at one time he used Beraneck's T. B. K. preparation.

Choroiditis.—Until within the last ten or twelve years practically all cases of choroiditis were considered of syphilitic origin, the few exceptional cases being the solitary tubercle (conglomerate) of the choroid and the miliary tubercles seen occasionally in the choroid in miliary tuberculosis, in the later stages of general tuberculosis and in tuberculous meningitis; in the latter affection occurring supposedly in 2 to 5 per cent of the cases. To Mr. Sydney Stephenson and Dr. George Carpenter of England belong the credit of establishing the fact that many cases of choroiditis of supposedly syphilitic origin are really due to tuberculosis. Not only did these surgeons³² in 1901 show that miliary tubercles appeared much more commonly in the choroid in cases of tuberculous meningitis than had hitherto been supposed (in 50 per cent of the cases, in fact), but also their investigations since have demonstrated that tubercle of the choroid may be found in latent tuberculosis as well as in active and at any and every stage of the disease. And Sydney Stephenson in one case of choroidal affection found tubercle bacilli in the aqueous humor which proved beyond doubt the nature of the etiology. Marple,³³ who formerly looked on Stephenson and Carpenter's statistics, in which they found choroidal lesions in 50 per cent of their cases of tuberculous meningitis, with some degree of doubt, has later, by closer examination of such cases at the Babies' Hospital in New York, found 100 per cent of choroidal lesions in such cases; that is, in every one of thirteen cases examined. And as to the frequency of lesions of the choroid of a tuberculous nature in the more chronic and latent forms of tuberculosis, the observations of Stephenson and Carpenter have been fully confirmed by many oculists, as a glance at the recent literature will attest. Tuberculin, both in diagnostic and therapeutic injections, has been of the utmost service in arriving at a differential diagnosis in these cases.

Carl Koller³⁴ states that tubercle of the choroid is not only more common than we have heretofore thought, but that it occurs with a distinct clinical picture, and should be classified as one of the ophthalmoscopically recognizable forms of choroiditis. Two clinical classes we have already; first, the conglomerate or solitary, and second, the multiple miliary form; and he says:

"In the third class should be placed miliary tubercles of the choroid, whether solitary or multiple, which runs a chronic course, which recur, and which may be associated with chronic tuberculosis of other parts of the body, but may also frequently be found in persons in whom no other tubercular focus can be proved."

Koller gives a graphic description of the condition and reports three cases. I shall report briefly just one case of this nature, as illustrating both the diagnostic and therapeutic value of tuberculin in such cases.

Case 3.—July 15, 1912, W. B. H., aged thirty-one, male, married, father of one healthy child. History of pleurisy on left side when a child. Robust now. No lesions of any kind shown in the body by physical examination. Blood and urine examinations normal. History of recurrent attacks of choroiditis in the left eye for sixteen years and in the right eye for eight years.

The present attack began in June, 1912, affecting both eyes, and when the patient came under my observation in July he had just returned after a three weeks' treatment from a private sanatorium, where he had had mercury and vapor baths, and the usual local treatment. In this, as in all previous attacks, the trouble had been considered of syphilitic nature and was treated accordingly.

Right eye: Vision equaled 8/200, central spot of choroiditis reddish yellow, with a few radiating white streaks from it surrounding, ring-like, the whole macular region. Two fresh spots of choroidal exudate above this, one $1\frac{1}{2}$ disc-width from it, and the other at twice that distance. Perivascular changes, optic disc swollen and vitreous hazy. In the inferior part of the fundus numerous old patches of choroidal atrophy.

Left eye: Vision equaled 18/200, central ring-shaped patch of old choroidal atrophy completely surrounding the macula, and on each side of this old patch (in the horizontal meridian) a slight amount of fresh exudate is thrown out. Other parts of the fundus quiet, except for a number of yellow pin-head sized spots of exudate into the choroid about one disc-width above the macula.

The patient was under mercurial treatment, which I allowed to continue until tuberculin tests could be made, when it was stopped. Patient was put to bed and the temperature taken

for two days and found normal. Pirquet test with old tuberculin caused a local and a general reaction, temperature 99.2—, and in the right eye a focal reaction. After four days the subcutaneous test of 0.5 mg. of O. T. was given. A decided general reaction took place: temperature 100.8, headache, loss of appetite, chilliness; arm was very sore and there was enlargement of lymph nodes in the neck; focal reaction in each eye. One week later, temperature being normal for three days and the eyes quiet, the first therapeutic injection of 2 mm. of B. E., Vial 1 (Mulford) = 1 10,000 mg., was given. Next day the temperature was slightly increased and a decided focal reaction in the right eye. After a few days the eyes became quiet and vision improved, in the right eye equaling 12/200 and left 20/200. Patient was sent to his home in the South and continued the B. E. injections at intervals of from one week to ten days, the largest dose reached being 14 mg. of Vial 1 (Mulford) = about 1/500 mg. The injections, Dr. Claud Trapp, under whose care the patient is now, tells me often caused slight focal reactions. He is still under treatment, has gained flesh and uses eyes constantly. March 12, 1913, vision in the right eye equaled 12/100, in the left 20/30 +.

Retinitis.—As in choroiditis so in retinitis, tuberculosis has been shown to be the exciting cause in many more instances than was formerly thought. Igersheimer³⁵ asserts that many cases of retinitis in which the retinal vessels are markedly involved are due to tuberculosis. This is in accord with the views expressed by Axenfeld and Stock,³⁶ who have shown the frequency of tuberculous infection in some portion of the body in cases of recurrent retinal hemorrhages in adolescence, in which cases the retinal vessels, especially the veins, are markedly involved by perivascular changes. The tubercular origin of such cases is manifested by a general reaction, and to a focal reaction in the eyes to tuberculin injections, and by clinical symptoms of tuberculosis also in some cases. J. W. Sterling³⁷ has published two such cases with clinical manifestations. Retinitis proliferans is supposed often to be due to the same cause, that is, to tuberculous infection in some part of the body.

Stock and Axenfeld state that these cases do not respond well to the therapeutic injections of tuberculin, and in this I

concur if I may judge from my experience with one case. As a report of this case of recurrent retinal hemorrhages occurring in a young man (aged 22 years) has already been published in full,³⁸ I shall add only the further note that the left eye, which had vision equal to 20/40, at the time the report was published, has since lost the vision in that eye completely (hand movements) and the vision in the right eye is about 4/200, eccentrically. Extensive retinitis proliferans with detachment of the retina following the hemorrhages into the vitreous was responsible for his loss of vision. That the etiologic factor in this was tuberculosis was evidenced by the marked positive general reaction and also the focal reactions in the eyes, produced by the diagnostic and therapeutic injections of tuberculin.

Dor³⁹ also states that cases of retinal tuberculosis are rebellious to treatment. He has reported three cases, and has also reported five cases of detachment of the retina treated by tuberculin injections. Three of the patients had tuberculin histories and symptoms, and in three of the cases myopia was present. In three of the five cases of detachment he secured complete and permanent reattachment, in one reattachment, but with relapse, and in one no effect was produced. Along with the tuberculin injections, however, he gave subconjunctival injections of sea water.

In my practice I have had experience with but one case of retinal detachment due to tuberculosis, occurring in a robust young married woman with no other signs of tuberculosis, except the focal lesion in the left eye.

Case 4.—No history of tuberculosis in family; Wassermann negative. Right eye hyperopic and normal in every way, vision equaled 20/15. Left eye hyperopic, detachment of retina lower part of fundus, far forward; vision equaled 20/200 in upper half of field.

Patient had been treated for fifteen months when she came under my care. Pirquet test was positive and subcutaneous test 0.5 mg. O. T. strongly positive, general and focal reactions. She has also reacted generally and focally to therapeutic injections of B. E., under which she has been for the last fifteen months. Initial therapeutic dose was 1/10,000 mg. B. E., largest dose 1/200 mg. At one time during the course of treatment the patient developed a fresh exudate in the choroid, down and nasally from the left macula, which reduced the

vision temporarily to counting fingers at four feet. This later cleared up, but left a temporary scotoma. Present vision in left eye equals 20/70; the detachment is decidedly reduced and the field enlarged. Patient has gained 16 pounds in weight.

Optic Neuritis.—There have been some cases of optic neuritis and postbulbar neuritis reported as due to tuberculosis. W. E. Gamble¹⁰ gives the histories of two cases of optic neuritis of obscure origin, in which the patients reacted violently to large diagnostic injections of tuberculin, both general and focal reactions taking place, with marked temporary reduction of the vision, but with ultimate recovery in each under the therapeutic injections of tuberculin. I have under treatment with tuberculin injection two cases of optic neuritis of tuberculous origin, but as they are still under observation I shall not report them here.

Muscular Palsies—Mackay¹³ has reported three cases of muscular palsies due to tuberculosis, the clinical histories, positive reactions to diagnostic tuberculin injections and improvement under therapeutic injections (Perlsucht) confirming the diagnosis in each case. One patient was entirely cured, with great improvement in her general condition, while the others were markedly improved but were still under treatment.

CONCLUSIONS.

1. We may safely state that the tuberculin reaction tests play a part as important in arriving at a correct diagnosis in tuberculous diseases as does the Wassermann reaction in syphilitic diseases. Both are of the utmost value often in making a differential diagnosis.

2. As a therapeutic agent, tuberculin, used in the right way, is the most valuable remedy we possess in the treatment of ocular tuberculosis. Used consistently, and persistently over a long course of time, the results accomplished at times are little short of wonderful. But it should be ever kept in mind that we are dealing with a powerful toxin, and with one that is capable of doing much harm if not properly given, and in the right dose. Each patient must, therefore, be individualized and treated according to his or her reaction to the remedy, for we are dealing with a remedy that is not a cure in itself, but acts by stimulating the body cells to manufacture the "antibodies" or protective materials for its own defense against the tubercle bacillus.

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II.

TWO CASES OF BINOCULAR COLOBOMA OF THE OPTIC NERVE IN THE SAME FAMILY.

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PHILADELPHIA.

Coloboma of the optic nerve entrance is one of the rarest of congenital anomalies, especially if unassociated with a defect of the surrounding choroid. The condition is differently described by writers as coloboma of the optic nerve or of the nerve entrance, or as coloboma of the sheath of the nerve. While one or the other term has been used to describe the condition as seen with the ophthalmoscope, later histologic studies are quite at variance with the results of the fundus examination. Occasionally a cystic enlargement of the nerve sheath gives the scleral opening an undermined appearance, and, while the enlarged scleral aperture may be free from apparent notching at its lower margin, as was shown in a case published by Manz¹ in 1891, yet, as in his case, it is impossible to tell with the ophthalmoscope whether or not there is a true coloboma of the nerve or its sheath. Coats² agrees with von Hippel³ that the lesions, even in cases which closely resemble each other clinically, present no uniformity microscopically, and believes with him that the term "coloboma of the nerve" should replace that of "coloboma of the nerve entrance." That this nomenclature may lead to confusion is shown in Cosmettatos⁴ cases, in which the anomalies are entirely confined to colobomata of the choroid surrounding normal discs, and are published under the title of "Coloboma of the Nerve Entrance." Reliance must be placed upon the ophthalmoscope, at least until years later, when an autopsy might throw further light upon the case. A convenient classification would consist of two groups—one in which no choroidal fault in the margins of the pseudodisc is shown by the ophthalmoscope, and the other those cases in which microscopic examination indicates the nature of the defect. The latter series should be pub-

lished with full microscopic details, so as to eliminate the difficulties in understanding the complex and misleading relations due to varying congenital changes.

There seems to be a diversity of opinion as to the rarity of coloboma of the optic nerve unassociated with a similar defect of the adjoining choroid. Vossius⁵ found only three cases in 12,000 patients, and Casper,⁶ in 1885, collected a total of twenty cases, which number was increased to forty-eight by Saemisch⁷ in 1891. Coats,² in his excellent monograph published in 1907, gave a total of six unequivocal examples, including his own, in all of which he had made histologic examinations.

It seems probable that some writers include cases of incomplete colobomata, which should more properly be classified separately, as they appear to be more nearly allied to the extreme type of the common physiologic cup. It is also likely that some have included cases in which there is a small defect in the adjacent choroid. Collins and Mayou⁸ account for the formation of colobomata in this region as follows:

"The fetal ocular cleft normally closes early in fetal life, cutting off the mesoblastic structures external to the secondary optic vesicle from those internal to it.

"In some animals a permanent union between the mesoblastic structures inside and outside the eyeball exists, the ocular cleft never becoming entirely closed. In fish the falciform process projects upward through the cleft and in birds the pecten.

"Occasionally in man a union is found to have persisted between the tissues external to the retina and the vitreous humor, which is usually atypically developed, in the region of the cleft. Such a union must necessarily prevent the edges of the secondary optic vesicle coming together and a gap or coloboma in the retina results. Eyes with this form of coloboma and atypically developed vitreous do not expand to the full extent and are microphthalmic.

"A delay in separation of the external and internal mesoblast, without permanent union, may also result in failure in the closure of the cleft in the secondary optic vesicle and the formation of a coloboma. When this occurs, the changes are not limited to the structures derived from the secondary optic vesicle, but involve also those immediately external to it.

If the defective closure is in the extreme posterior part of the cleft, there is a coloboma of the optic nerve-sheath; if somewhat further forward, a coloboma of the choroid; if near the anterior lip of the cup, a coloboma of the ciliary body and of the iris which normally grows forward from it."

According to Parsons,⁹ the shape of the coloboma is generally round or vertically oval; the size may be from twice to twenty times the usual diameter of the disc. Total excavation is uncommon, and the greater depth of the lower part is the rule. Collins and Mayou state that conditions which are termed colobomata of the optic nerve are often colobomata of the choroid, reaching up to the nerve, which have become ectatic, so that the lower border of the nerve is displaced upward and backward, the surface of the papilla facing downward. In such cases the sheath of the nerve is not involved in the coloboma. Van Duyse¹⁰ ascribes to colobomata of the optic nerve the following characteristics: (a) Enlargement of the papillary area with irregularity of form; (b) partial or total excavation, the greatest depth being in the lower part; (c) glistening white surface alternating with shades of gray in the excavated portions; (d) special disposition of vessels. Beard¹¹ states that often the excavated portion is surrounded by what seem to be exaggerations of the pigment and scleral rings, and when the whole area within the scleral ring is depressed, he likens the condition to that of a magnified glaucomatous excavation. In a coloboma of the nerve alone, according to Collins and Mayou, the nerve-entrance is practically of normal dimensions, and all the abnormalities are within its boundaries. A fold of retina is then found passing through the lamina cribrosa and hollowing out the nerve. Pathologically, it would be differentiated from one involving both choroid and nerve by the relation which the excavation bore to the intervaginal space in the sheath of the nerve. If on its inner surface, it would be a coloboma of the nerve; if on the outer surface, a coloboma of the choroid.

Caspar's classification of the arrangement of the vessels is widely quoted. He divides them into three groups: (1) Those in which all the vessels emerge from the lower part of the pseudodisc, even those which subsequently turn upward. (2) Those in which the vessels emerge at or a little above the

center, and are nearly normal in arrangement. (2) Cases in which the vessels appear at the edges around the whole circumference of the disc. It seems to be agreed that, when the latter formation is found, the vessels are generally of the cilio-retinal type.

Vision has been found to be normal in some instances and entirely lost in others. If both eyes are affected, as Beard thinks is commonly the case, it is usual to find one with almost normal vision and the other blind, as in the author's cases. Frequently the condition is found associated with microphthalmus.

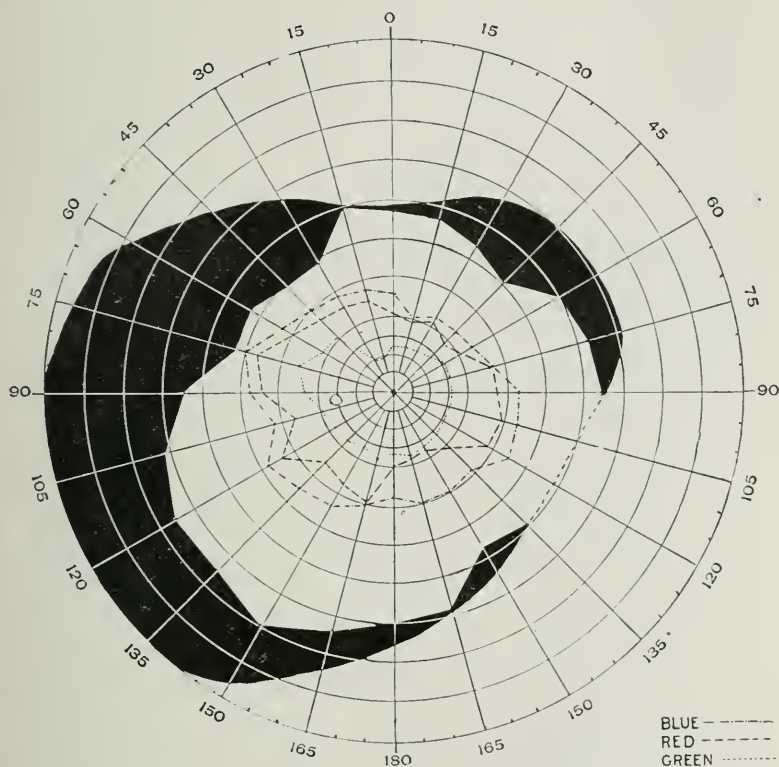
The cases studied by the writer were a brother and sister, the former exhibited before the Society. In both the right eye was blind, while the vision of the other was almost or quite normal. The mother and two younger brothers were free from ocular anomaly, while the father and elder brother, who were not examined, were said to have no eye trouble. The parents gave no history of consanguinity or venereal disease. The maternal grandfather had defective vision, one eye turning upward more than the other.

CASE 1.—A rather timid, blond young man, aged twenty, who, although blind in the right eye since birth, had never consulted an oculist and only recently applied for treatment at the Wills Hospital, where he was placed under the care of Dr. P. J. Pontius, through whose courtesy I have the privilege of reporting the case.

The eyes are both of normal size and practically straight. The corneæ and irides are normal, but the right pupil is enlarged, and there is only consensual response to light, the other acting normally. There is no nystagmus, but nictitation has been excessive and involuntary. The right eye can wink alone, but on attempting to wink with the left, both lids close. The vision of right eye is reduced to poor central light perception. Of two small lights held before the eye, one alone can be seen, even though they be brought together. V. L. E., uncorrected, = 6/9, with — 0.25 s. — 0.37 c., axis 30° = 6/6, the field being but slightly reduced.

The fundus of the right eye presents a striking appearance, the papilla having been replaced by a large, almost round, sharply defined scleral aperture which appears to be about two and a half times the size of a normal disc, although a

myopia of 6 D. no doubt accentuates the size. The depths of this gray, homogeneous looking cavity, when explored with a — 18 D. lens, disclose the presence of a shadowy vessel, which, arising centrally, branches and passes downward out of view, but is no doubt the origin of the two groups of inferior vessels which pass from the undercut edge of the



Case 1.—Left Eye. Form and Color Fields.

pseudodisc to the retina. Above, two similar groups of vessels appear from beneath the undermined edge and pass upward in a fairly normal manner. The aperture is remarkable for its thin, cleanly cut edges, which are laterally dashed with two narrow spots of pigment. Equally clean cut are three wing-like, grayish-white choroidal faults which inclose

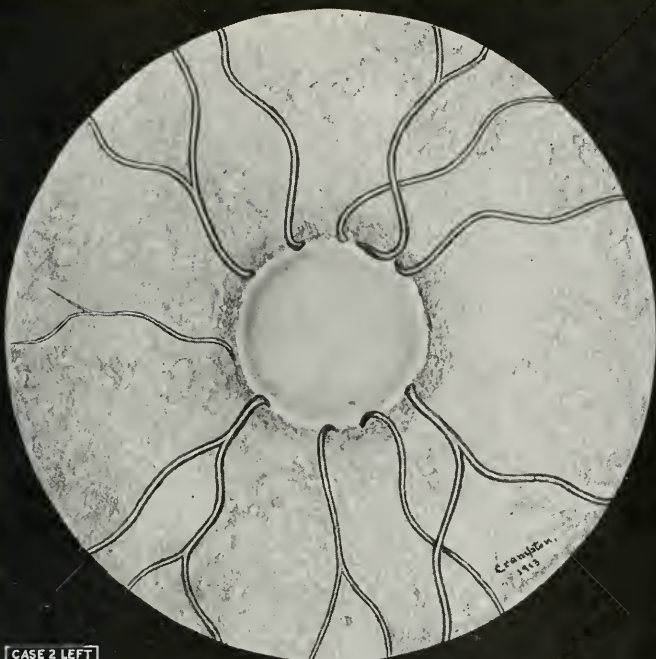
the disc except on its temporal side. The area of exposed sclera on the nasal side is about the size of the scleral aperture, while the areas above and below are half this size and are well shown in the sketch. The remainder of the fundus, although the seat of some slight pigment disturbance, is apparently normal, and there are no evidences of a raphé.

The left eye is of equal interest and is everywhere normal, except that the disc, which is somewhat larger than usual, is transversely oval and deeply excavated. The normal retina appears to stop abruptly at a sharply defined scleral ring, which, although broader than usual, presents no marked irregularities. Within this and about the margins of the rapidly receding cavity there are scattered islands of pigment. The scleral opening is largely undercut, and the vessels, seen in the depths of the nasal side, are with one exception lost to view before piercing the semitransparent margins to pass to the retina in two scattered groups above and below. One branch of the deep vessel climbs diagonally up the superior wall and passes to the upper temporal part of the fundus.

A large main cavity extends to a certain depth, and from its floor tunnels appear to pass laterally and backward, especially on the temporal side, where one's imagination assists in picturing a beautiful, yellowish-gray grotto.

The deep vessel in the nasal side can almost be carried in the same focus with those of the surrounding fundus, but the homogeneous nature of the deeper portions prevents an estimation of their depth, which, however, is probably not excessive.

CASE 2.—Sister of Case 1, aged five years, who has had a squint since birth. The examination, in which Dr. William T. Shoemaker kindly took part, proved difficult on account of the active, lateral nystagmus. The eyes were of equal size, and, aside from a moderate inturning of the totally blind right eye, were externally normal. The fundi also appeared so, except for the following congenital changes: Both discs were replaced by deep round apertures having sharply defined and apparently undercut margins. No details were observable in the grayish, homogeneous depths. The vessels appeared about the edges of the pseudodisc, around which they were distributed in a fairly uniform manner, no doubt being of the cilioretinal type.



CASE 2 LEFT



CASE 2 RIGHT

Binocular coloboma of the optic nerve.

There were no choroidal defects about the disc margins, but in the lower part of the right or blind fundus there were two colobomata, one of which was sharply circular and pearly white, with a diameter of about two-thirds the size of the disc. To the temporal side of this strikingly white area, and also two or three diopters from the disc, there was a slightly larger, irregular coloboma of the choroid with pigmented margins. It was impossible to secure satisfactory visual fields. V. R. E., no l. p.; L. E. = 6/9 to 6/12 by object tests. Although tonometric measurements were not made in either case, numerous tactile tests showed the tension to be normal.

In the excellent monograph of Coats, to which reference has been made, the reported cases are classified from the pathologic standpoint in the following three divisions:

(1) All cases in which the lesion is a coloboma of the choroid beneath the nerve, the latter being normally formed, and sharing only passively in the deformity. To this category belong the cases of Liebreich,¹² da Gama Pinto,¹³ v. Duyse (Cases 1,¹⁴ 3,¹⁵ 4,¹⁶ 6¹⁷), Manz¹ (case 2 from the eye of a rabbit), Bock¹⁸ (1), Gorlitz,¹⁹ Bach,²⁰ Knapp²¹ (1, 2, from a rabbit), Elschnig²² (4, 5)—fourteen cases in all.

(2) Cases that show a coloboma of both the choroid and nerve. To this class belong the cases of v. Duyse (2,¹⁵ 5¹⁷), Manz¹ (1), Hess²³ (?), Bock¹⁸ (2, 3), Bach²⁰ (5, from the eye of a rabbit), Bernheimer²⁴ (probably the result of hydrocephalus second to leptomeningitis), Elschnig²² (1)—nine cases.

(3) Cases in which the lesion is a coloboma of the nerve alone, the adjacent choroid being normal. To this category belong the cases of Ginsberg²⁵ (from the eye of a rabbit), Gorlitz,¹⁹ v. Hippel,²⁶ Elschnig²² (3?)—four cases.

Coats gives very good abstracts of these cases, and discusses the findings very fully. He admits, however, the difficulty one encounters in attempting to classify some of the cases. For instance, it is uncertain whether those of da Gama Pinto, Hess, and Bernheimer are colobomata of the nerve or of the choroid beneath it, and also whether Elschnig's case 3 was a true congenital abnormality. Gorlitz's case appears in Groups 1 and 3 because there seemed to be two distinct abnormalities.

Including the two cases of the writer, one with an uncom-

plicated coloboma of the left eye and the other with both so affected, there are on record, so far as it has been possible to find, twenty-one cases in sixteen patients. In this are included the five cases collected by Coats and three cases of Nieden, which were published prior to his paper, and which he fails to note; also the ten cases which have reached the literature since that time.

Nieden²⁷ (1879) seems to have described the first three cases of complete colobomata confined to the nerve or its sheath, although the histologic findings were not obtainable. The three examples belonged to two persons, one of whom had the anomaly in two eyes. This latter was a boy aged nine years, whose right papilla was vertically oval and nearly twice the normal diameter. The scleral rings were somewhat removed from the disc, which was of a brilliant bluish white color. The vessels were grouped largely above and below, and might be said to belong to Caspar's second classification, as those above arose from near the center of the disc. The lower ones, however, bent in a curve over the edge of the lower scleral margin, from beneath which they appeared to come. There was no defect of the choroid. On account of corneal maculæ caused by trachoma the vision could not be obtained with accuracy. After correction of the hyperopia, V. = 10/40. The tension was normal.

The left eye was practically identical, except that the pseudodisc was more depressed and the vessels arising entirely from below placed it in Caspar's first group. With this eye he could count fingers at two feet, notwithstanding the corneal opacities. In the second case, a woman aged twenty-five, who also was nystagmic, there was a coloboma of the right eye, almost identical with the right eye of the foregoing case, without further fissure of the uveal tract. In the patient's other eye there existed a coloboma of the iris, choroid, and retina. Here also the vessels came under Caspar's group 2. V. R. E. = 1/3 to 1/2; L. E. = fingers at sixteen feet. Nieden's fourth case appears to be a partial coloboma of the disc, and therefore will not be considered further than to state that there was a deep, oval, sharply defined sinus occupying the lower half of the disc in a girl aged nineteen whose eye was microphthalmic.

It is probable that the first histologic study of a coloboma

of the optic nerve, where there was no directly associated defect of the choroid, was the case published by Gorlitz¹⁹ in 1897. There is some doubt about the case, however, as there were two probably independent abnormalities. Coats considers the ophthalmoscopic picture of coloboma of the nerve entrance in this case to be due to a defect, not in the nerve, but in the choroid bordering its lower edge. In addition there were defects within the nerve itself, in the lamina cribrosa; these, however, were filled in with nerve fibers, and were perhaps invisible ophthalmoscopically. The papilla was oval and enlarged to three times its normal diameter, the whole pseudodisc being excavated below more than above, as so often exists. The fundus was otherwise normal. The vessels entered with a sharp bend at the edge of the coloboma, except one artery and vein on the nasal side, which arose in the center. The globe was of normal size, but the cornea was small. At the junction of the sclera with the nerve below there was a bulging without sharply delimited anterior or lateral boundaries, which belonged partly to the nerve sheaths and partly to the sclera.

Brief mention of the microscopic details, while difficult to follow without the aid of an illustration, may be of interest, as the proper classification of the case is in dispute. Microscopically, the nerve entrance occupied somewhat more than one-half of the excavation at the posterior pole, the remainder being formed by a recess filled with densely intertwined masses of fibrous tissue. The intervaginal space, although enlarged above, was in normal relation to the surrounding structures. Owing to the formation of the ectasia immediately beneath the nerve, the entrance pointed downward. A defect in the sclera below the disc formed the entrance of a small cavity, reaching beyond the surface of the globe, which was filled with tissue of the nature of altered retina. The central vessels were present in the nerve. Somewhat below the center of the papilla there was a small but almost complete gap in the lamina cribrosa, which elsewhere was well developed. In the upper part of the lamina there was another deeper defect, at the bottom of which was an empty space.

In the following year v. Hippel²⁰ published a case which he believed to be a true coloboma of the nerve not including the choroid. The case was that of an infant whose globe

was of normal size and appearance. The choroid ended in the usual manner at the edge of the porus opticus, which measured 1 mm. across. Instead of being filled by the entering nerve, it was occupied by a cyst-like invagination of the retina which projected through the sclera and came into contact with the tissues of the orbit. The central vessels were absent.

A period of eight years passed before Parsons and Coats,²⁸ in 1906, published a case which appears to belong to the same type. Coats described this more fully in 1908 in connection with his other two cases. The specimen was obtained from a child ten months old. A very deep coloboma at the nerve entrance, as well as a macular coloboma and an excavation on the nasal side of the papilla, could be seen with the ophthalmoscope. At the junction of the nerve with the sclera there were two cystic swellings. One on the nasal side formed an almost perfect hemisphere, while another further back appeared to hollow out the nerve itself. On dividing the globe, which was small, there was seen an exceedingly deep pit in the position of the optic nerve. The retina was not defective, and on all sides reached up to and passed into the excavation. The vessels emerged chiefly on the nasal side in several isolated trunks. All the anterior parts of the eye were normal. Parsons⁹ believes there can be no doubt that in this case the cyst invading the nerve is a true "coloboma of the nerve sheath," not an excavation of the nerve proper. On each side the sclera and choroid come to their normal terminations. This is especially well seen on the temporal side, where the intervaginal space gives a good rallying point, and just within it the sclera terminates in a sharp promontory. The choroid ends in the same position, and the retina a little further in, being dragged round into the excavation for a short distance. On the other side the sclera, choroid, and retina also end in normal relations to one another. There is, therefore, no coloboma outside the normal limits of the porus opticus.

Coats' two other examples occurred in an anencephalic fetus born at term, and were, therefore, similar to v. Duyse's¹⁶ Case 4. Externally the globes appeared normal except for the thinness of the optic nerves. On section the papillæ did not appear to be enlarged or greatly excavated, and all the

other intraocular structures were normal. At the lower edge of the nerve a deep pocket passed backward into the nerve and terminated in a blind end which destroyed the inferior half of the nerve, but the defect was entirely within its limits, the choroid and sclera taking no part in the formation. The nerve consisted of the supporting framework only, no nerve fibers having been observed. The central vessels passed into the center of the nerve in a normal manner, but on reaching the colobomatous area they were displaced upward and entered the globe beneath the upper border of the papilla. As both eyes were almost identical, only a brief general description is here given.

Lindsay Johnson²⁹ describes a coloboma in an intelligent lad, three and one-half years old, in whom the right eye was normal but the left remained undeveloped and smaller than the other, with a vision of mere light perception. The disc was lost in a large, egg-shaped coloboma in the inferior portion of, which there was a round, mother-of-pearl-like depression nearly the size of a normal disc. The defect above was almost on a level with the general fundus, while below it was more depressed. The superior vessels terminated in the center of the coloboma, while the numerous lower ones passed in over the lower scleral margin and disappeared. Elsewhere in the fundus there was a small coloboma of the choroid.

Occasionally the normal site of the disc is occupied by an enormous kettle-shaped cavity or cystic dilatation which has been known to attain a size greater even than the eyeball itself. A moderate sized example of this condition is shown in the case of Hosch,³⁰ in a girl, aged eighteen years, who had a coloboma of both nerves without deformity of the choroid. In the right eye the scleral opening was two or three times the size of a normal disc, and expanded into a tremendous kettle-shaped cavity having sharp margins, which were irregularly undercut. No lamina cribrosa was seen. Hosch found it impossible to estimate the depth of the cavity with a Landolt ophthalmoscope. A number of fine vessels sprang from the sides of a light central area in the depths of the cavity. The left eye was similar, with a somewhat larger cavity, and up and out from the disc there was a rounded

ectatic area. The vessels were similar to those of the other eye.

In a case reported by Parsons³¹ the scleral aperture, while appearing to be very deep, was only 2 D. below the surrounding fundus, which was hyperopic about 4 D. The disc was very much enlarged, with all the vessels appearing at its margins, principally above and below. Elsewhere the fundus was normal. The field was almost as large as that of the right eye, in which it was quite normal, as were also the fundus and vision. V. L. E. = 6/60, corrected to 6/24. Tension normal.

Werner³² examined a girl, aged nineteen, whose right eye, smaller than the left, showed a large and deep excavation having in places a pigmented border, in size about 4 D. The lower edge of the excavation was narrow and rounded, with a few small vessels curving round it. The upper wall of the excavation sloped backward from its edge for some distance, forming another and deeper excavation, while inside and to the left was another still smaller cavity. The center of the excavation was of brilliant white appearance. The whole of the disc was replaced by the excavations. Vision was reduced to the counting of fingers to the outer side.

In the case reported by Chance,³³ a child aged six years, whose parents were unrelated, and in whose family there had occurred no ocular anomaly, was noticed in infancy to have an inturning eye and poor vision. The tension of both eyes was normal and there was no external abnormality. The left disc was irregularly circular in outline, without regular rings, and had the appearance of a slightly raised crater four times the size of an ordinary disc. A dusky white fibrous ring, crimped into more or less deepened, pigmented folds, surrounded the aperture, which indefinitely resembled a bunch of cotton wool. Inside the rim of the pseudodisc a narrow, deeply pigmented, shelf-like projection was seen, beyond which the cavity in the shape of a receding cone sloped regularly backward to an uncertain depth, as much as — 20 being obtainable. No central vessels were seen, but numerous small scattered vessels crept up the sides until lost to view by the overhanging scleral aperture at the base of the cone. Over this they appeared again to pass to the retina over the raised, crater-like margin. The other eye was practically

normal, and there was no physiologic cup. V. R. E. = 5/10, corrected to 5/5; L. E. = 5/50, corrected to 5/30.

In a number of instances typical colobomata of the disc in which there was no extension of the fault downward, have been associated with an equally interesting coloboma of the macula lutea, and no doubt the congenital fault in this latter position has often been mistaken for a macular choroiditis.

The changes most often met with in this location are described in the papers of Parsons,⁹ Bock,¹⁸ Hess,²³ Deyl,³⁴ v. Duyse, and Oeller.³⁵ The latter gives the details of a case which comes within the limits of the writer's series, in that a coloboma of the disc, uncomplicated with a choroidal fault adjacent to the nerve, was associated in both eyes of a young woman with a very definite central or macular coloboma. As might be expected, vision was reduced to: R. E. = 2/60; L. E. = 3/30, while her correction of — 5 D. failed to improve. The fields were normal, excepting a scotoma of the right eye corresponding with the choroidal patch, and both eyes were slightly microphthalmic. The disc was slightly enlarged and excavated, while an indefinite pink ring outlined the cavity and no doubt carried the nerve fibers. The vessels arose about the periphery. The case of Parsons and Coats, already alluded to, was also of this type, although unique in being the only one reported where, notwithstanding a macular coloboma, there remained an imperfectly formed but quite recognizable fovea. The most defective layer was the pigment epithelium, which was present only in islands and had entirely lost its pigment. A point of interest was the absence of any evidence of inflammation, no adhesions being present between the retina and the choroid. This fact is cited by Parsons as another addition to the considerable body of evidence against Deutschmann's³⁶ theory that all colobomata are due to inflammation in early fetal life. It seems evident, therefore, that the adhesion between retina and choroid, and the deep excavations which have been usually found in pathologic examinations of colobomata, are secondary phenomena, due to subsequent inflammation or to stretching and giving way of a weak part of the globe. Pause's³⁷ case confirms this view, as both the choroid and retina were free from evidences of inflammation over a coloboma of the choroid. The pigment epithelium, while present, was devoid of pigment.

Zade's²⁸ case is of interest, as there was binocular coloboma of the optic nerve with normal function in one eye. A blond man, aged twenty-one years, had pseudonystagmus. The right eye, in which there was an associated defect of the choroid, was divergent and myopic. Minus 16 D. glasses failed to improve the vision. The light gray fundus merged into a narrow gray scleral ring at the sharply defined disc margin, leaving a large round scleral aperture twice the size of the other disc, the apparent dimensions being no doubt influenced by the high degree of myopia. The vessels appeared to spring from the periphery of a homogeneous gray area in the center of the cavity, and passed to the retina evenly distributed about the disc margin. Adjoining the pseudodisc, and separated from it by only a narrow red area, there was a pale pink defect in the choroid in the shape of a sugar-loaf pointing up and out. Below and in from the disc, and almost touching it, there was a less distinct but larger curved area of lighter color than the surrounding fundus, and apparently slightly raised, as shown by the course of the vessels. Otherwise the fundus was normal.

In the left eye the defect was confined to the nerve. The vision and field were normal, which was surprising, considering the appearance of the disc, which resembled a glaucomatous cup and required a — 7 D. lens to reach its depths. The disc was normal in size, well defined, and of a pronounced gray color in its funnel-like depths. The vessels were of normal caliber, and were fairly evenly distributed about the scleral aperture, over which they passed to disappear from view. The funnel-shaped cavity in the disc pointed downward and in. There were no other lesions in the fundus.

There was some doubt in the minds of those who discussed the case reported by Dor²⁹ whether a coloboma of the optic nerve is a congenital possibility. From Dor's description, however, there is little doubt of its being a typical case. A man, aged fifty-eight years, consulted him in regard to a beginning cataract in the left eye, the vision of which was 8/10. V. R. E. = 1/10. The right papilla was larger than the left and had a grayish, excavated surface, in which no vessels were visible; they appeared, however, about the periphery and spread to the retina. No mention was made of a choroidal defect.

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III.

NEW CATARACT GLASSES.*

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NEW YORK.

Some time ago a patient of mine had a new form of cataract glass made by Bausch, an optician of Rochester, which was lighter and better looking in every way than the one he was wearing.

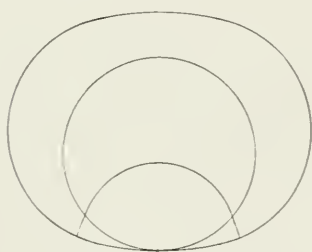
It consisted of a small toric convex lens in which there was an invisible lower segment; on the concave side of the toric lens, covering both the distance part and lower segment for reading, was a thin, circular paster, and the adjustment of the several values was so arranged that the distance correction consisted of the toric plus the paster; and the correction for near consisted of the bifocal segment plus the paster.

In another patient, for whom I had prescribed a sph. $+ 12$ for distance and $+ 14$ for near, and whose vision was 30/30, and who could read fine print with ease, I made a modification of the Bausch glass. This was ground by Elting and Pickup, of New York, and consisted of a thin, curved, non-refracting glass, with a fused plus segment below, and over this was placed the paster on the curved side (Fig. 1). I found, however, that with the strength of glass just mentioned she could not see quite as well as with her heavy pebbles. We then gave her the distance correction of $+ 13$ and the near correction of $+ 15$, which simply involved an increase of the paster strength of one diopter. With this glass she saw 20/20 with each eye, stated that she used both eyes together much more satisfactorily, that the definition of all objects was better, even than with her pebbles and that she judged distance better.

*Reprinted from American Ophthalmological Society's Transactions, 1913.

The difference between these two glasses is obvious. The old distance glass weighs one and one-half ounces; the reading, two ounces; while the new glass (bifocal) weighs three-fourths ounce. Moreover, the appearance of the patient is greatly improved. She is rendered less conspicuous, and the set of the glass, by reason of its lightness, is better and more easily adjusted.

In addition to the change just mentioned from the Bausch glass, I diminished the size of the paster and brought it completely down to the lower edge of the foundation glass. I think it possible to decrease the size of this paster further and render the patient still less conspicuous, while its usefulness will be preserved. This, however, is to be determined by experiment. I suggest, also, in case patients do not desire bifocal combination, that the paster alone be placed over



New Cataract Glass.



Section of Glass.

a plain toric lens for distance, and that for reading a stronger paster be used in a similar way.

It is advisable also that neither the foundation glass nor the paster should be too large, and, in fact, it is not necessary, otherwise there will be but little difference between the unsightly old ones and the new. I recommend the following measurements in the construction of this glass: Horizontal diameter, 40 mm.; vertical, 31 mm.; paster, circle of 25 mm. diameter; reading segment vertical, 12 mm.; horizontal, 19 mm.

To construct a lens of this description a toric Kryptok blank was selected as a base; on the outer side was ground a plus 6 curve; on the inner, a minus 6 curve; the result was a toric Kryptok lens with a plano upper and a plus 2 reading. Particular attention was paid to having this lens ground

thin, it being but 1 mm. in thickness. The focus grinding part of the basic lens being completed, it was cut to size and the edge finished. As has been stated, the upper part of the Kryptok lens was plano, the lower $+ 2$ D., and the strength required was $+ 12$ D. for distance and $+ 14$ for reading. It was therefore necessary to add that amount of power, which was obtained by using a knife-edge round segment, similar to those used in Opifex bifocal work, only 25 mm. in diameter. The curve on this segment was plus 6 on both sides; the two parts, the basic lens and the segment, were now cemented together, care being taken to attach the segment down so low that when used for close work the full reading strength would be available to the very bottom.

IV.

ANOMALIES OF THE RETINAL PIGMENT EPITHELIUM AND THEIR CLINICAL SIGNIFICANCE.

H. GRADLE, M. D.,

CHICAGO.

The homogeneous appearance of the normal fundus of the eye depends in part upon the integrity of the retinal pigment epithelium, which acts as a turbid medium, obscuring the structures behind it. Whenever these cells contain no pigment or less than the usual amount, the choroidal vessels become visible, as in albinotic and often in myopic eyes. In the present paper, however, I propose to consider, not the absence of pigment, but the appearance due to its irregular distribution.

Structural changes in the retinal epithelium have been demonstrated anatomically by Donders, H. Müller, Leber, Goldzieher and Fuchs, and were attributed by them to the influence of globular hypertrophies ("Drusenbildung") of the vitreous lamella of the choroid. According to Rosa Kerschbaumer,¹ anomalies are found in the pigment epithelium in three-fourths of all eyes of persons over fifty years of age, but are confined mostly to the anterior or ciliary region and extend only exceptionally toward the posterior pole. According to Kerschbaumer's description, some cells increase in size even up to six times their normal dimensions and lose their well-defined contours. Their nuclei multiply and karyokinetic figures appear. Degeneration takes place, the nuclei refuse stains, become pale and vacuolated. In some instances the entire cell disintegrates, leaving its entire pigment in a mass on the basal membrane. Some cells contain an increased amount of pigment, others less than normal or none at all. The pigment grains themselves may lose their rod-like shape and become small, round, and dark-brown. Larger round masses of pigment may also be seen between cells. On the other hand, rarefaction of pigment alone may occur without

other visible changes in the cells. Sometimes small areas are thus found devoid of coloring matter.

Since these changes incident to advanced age are mostly confined to the anterior part of the fundus invisible to the ophthalmoscope or seen only imperfectly, they seem to have been but little studied during life. There are, however, certain easily observed ophthalmoscopic appearances which can only be referred to similar anomalies of the pigment in the retinal epithelium, although these changes have not yet been anatomically demonstrated. I refer to the stippling or granular appearance of the fundus seen commonly around foci of choroiditis or retinochoroiditis. I have also noticed the same granular condition during the retrogressive stage of optic neuritis, in which it seemed most pronounced in the area adjoining the optic papilla. In purely retinal lesions I have never observed this peculiarity.

The special object of this paper, however, is to call attention to the frequent occurrence of the same appearance in the fundus of children and young people suffering from severe asthenopia. While the healthy fundus of adults presents almost always a homogeneous appearance, I have observed a more or less pronounced stippling or "granular" condition in about five to eight per cent of young people examined by me on account of asthenopic complaints.

Since all transitions occur between a perfectly homogeneous fundus and the extreme granular appearance, such as I shall describe presently, it is obviously impossible to state accurately the frequency with which this anomaly occurs. By limiting myself to those records that are fairly complete in details and which refer only to well pronounced appearances in the fundus, I can base this report upon the histories of forty cases. These were all instances of what I have described elsewhere as exaggerated asthenopia, ocular discomfort out of proportion to any existing error of refraction or other local anomaly present.

The ophthalmoscopic peculiarities to be described are usually most pronounced in the inferior nasal quadrant of the fundus. Less commonly they extend around the periphery of the entire ophthalmoscopic field and least often are they seen at the posterior pole. It must not be overlooked that in dark subjects the macular region often has normally a slightly

stippled appearance, which, however, may be considerably exaggerated in these patients.

The peculiar granular appearance of the fundus I cannot describe better than by comparing to a surface covered with a mixture of black and reddish powders, with a preponderance of the latter. Most of the separate grains are barely within the range of visibility, occasionally a few larger black points are seen; sometimes, but less commonly, a few white specks of pin-point size can be found. There are often in the same fundus small areas with so little pigment that the choroidal vessels become visible. When the rarefaction of pigment is not so extensive, the surface appears, in words of Loring,² not "smooth and hard, like a cloth with no nap to it," but "like one that has a plush or velvety feel." Some authors presumably mean this condition when they speak of a "woolly fundus." The condition is always symmetrical in both eyes, although sometimes more pronounced in one.

There are probably various reasons why these appearances have been so little noticed in literature. Occurring in eyes not otherwise diseased, they are easily overlooked, especially in the inverted image, unless specifically searched for. Moreover, when not pronounced, these appearances would be classed by most observers as within the normal range, unless systematic comparisons were made. Yet the frequency of this granular appearance in perfect eyes, and the very marked occurrence in connection with choroidal disease, suggest positively that it is a deviation from the normal type.

The subjects in whom I have observed this peculiar fundus were all of the neurotic type. In fact, the most striking appearances were found in the most pronounced cases of nervous disturbances. The most extreme instance I have ever seen was in the case of a boy with a very low vision, presumably due to some obscure brain lesion, but without ocular disease, where the fundus could literally be called "finely speckled." As evidence of the neurotic state, I have on my records the histories of frequent headache, chorea or habit spasm, general restlessness, emotional irritability and sometimes other manifestations of general neurasthenia, such as fatigue on slight exertion and insomnia. Very often the nervous condition was due to heredity. In other instances it could be referred to improper nutrition during infancy. In

some, presumably digestive disturbances were of influence, and a few times, anemia coexisted, perhaps had preceded it. The ages ranged from five to twenty-two years, with preponderance of the period from eight to fifteen years.

All of these patients complained of ocular discomfort, described sometimes as a burning, rather oftener, however, as an ache, and usually accompanied by more or less headache. While reading intensified the discomfort, most patients complained more or less while resting the eyes; and, indeed, very commonly much discomfort was noticed at once upon arising in the morning. Perhaps this was due to the effect of daylight upon the eye sensitized by darkness, for, as a rule, these patients were annoyed by strong light of any kind.

No indication was found that the pigment changes affect the acuity of sight. While perhaps a large number of the patients had less than perfect vision, there seemed to be no relation between the lowered vision and the amount of stippling, either in the periphery or in the macular region. In no case was there any history of gradual failure of sight. Amongst the forty patients, after the correction of all ametropia, vision equaled 20/20 or over in ten; 20/20 to 20/25 in twelve; 20/25 to 20/30 in twelve; under 20/30 in three; under 20/30 in one eye only in three.

In no case was there any intraocular lesion found to account for the low vision. In most cases the presumable cause must have been irregular astigmatism. In the three patients with a vision under 20/30, one had a myopia of 3.5 D.; in the other two, no cause could be found for a vision of 20/60. In the three instances of one-sided poor sight, the condition seemed analogous to the not infrequent amblyopia found in an eye slightly more ametropic than its fellow.

The refraction in the forty patients was: Emmetropia in nine; hypermetropia or astigmatism under 1 diopter in twenty-four; hypermetropia or astigmatism over 1 diopter in three; myopia under 3.5 diopters in four.

Very few so-called muscular anomalies were found. Not one of the patients had hyperphoria, and none of them esophoria under one degree or exophoria over three degrees. In thirty of them the converging power was normal, in ten slightly reduced.

The asthenopia was, of course, not of refractive origin in

the emmetropic patients, while complete failure to relieve by glasses proved that in fourteen of the cases with low degrees of hypermetropia or astigmatism, the complaints were likewise not dependent upon the ametropia present. In nine others, correction of the error proved of some benefit by allowing them to use their eyes with less discomfort, but could not be said to have given complete relief. In only four (three of these had errors above 1 D.) were all complaints stopped by glasses as long as they were worn. Yet even these cases do not come under the head of ordinary asthenopia due to refractive error, since their complaints, though really dependent upon the ametropia, were so decidedly more intense than we find to be the case in ametropes in good health. I have therefore come to the conclusion that in most of these patients the ametropia was only a complicating factor and generally one of minor importance.

The pigment changes are not necessarily of a permanent nature. I judge so partly by the fact that I have scarcely ever seen a pronounced granular appearance in the healthy fundus of people much over twenty years of age, even when suffering from neurasthenic asthenopia of long duration. Furthermore, I have watched the fundus several times during months, and once during several years, in patients with patches of localized choroiditis or chorioretinitis, and have observed that the stippling surrounding the foci can change or even wholly disappear after the disease has come to a standstill. Six of the juvenile asthenopes in this series of forty I have been able to see for many months, and two of these I reexamined after the lapse of one and a half and six years. In all of these the pigmentary stippling seemed to have diminished to a variable extent. In the one seen after six years it had disappeared entirely, but I must add that in this one it had never been very striking.

The treatment of these patients consisted simply in relative rest of the eyes and general hygienic measures. While abstinence from eyework proved of benefit in most instances, it alone was not fully curative. Indeed, some of the children were brought to me on account of the persistence of their discomfort during school vacation. In some instances the temporary relief from the use of smoked glasses was very striking, more so than I have ever seen in any other form of func-

tional disturbances of the eyes. In all cases in which the correction of existing ametropia gave any relief, even if only partial, the glasses were continued while under observation. For ultimate success, however, I trusted mainly to measures directed against the neurotic condition—liberal outdoor exercise, sojourn in the country, bathing, correction of habits and diet, iron if required, and sometimes strychnia. About one-third of these patients lost their eye complaints and headaches under this treatment in the course of months, another third were improved to a variable extent, while the balance could not be watched a sufficiently long time to be recorded regarding the final outcome.

The exact significance of the pigmentary changes described is not made plain by these observations. It must not be forgotten that cases of a very similar clinical history, but with a homogeneous fundus, are not uncommon. On the other hand, the frequent association of the stippling and granular appearance with this exaggerated asthenopia of young subjects, and its rare occurrence in eyes without complaint, suggest a definite relationship. It does not seem probable to me that the changes in the pigment epithelium are the direct cause of the asthenopia. But they presumably contribute to make the eye more sensitive. The occurrence of similar changes in these cells around choroidal foci suggests that they may result from nutritive or circulatory disturbances in the choroid. What role such disturbances play in asthenopia of the type described we do not know. At any rate, the greater prominence which the pigmentary changes present in markedly neurotic subjects raises the question whether instability of the central nervous system may not reveal itself by the liability of the retinal pigment epithelium to undergo structural changes. For these cells, like the retina proper, are embryologically a part of the brain.

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V.

SENILE CATARACT EXTRACTION FOLLOWED BY
CERTAIN COMPLICATIONS.*

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Upon examining case histories of senile cataract extractions it is readily observed that the greater proportion of such patients coming to operation are between the ages of sixty and seventy-five years, a very small minority occurring above the age of eighty years.

The following communication is not referable particularly to the complications arising during or immediately succeeding the performance of these operations, but rather the subsequent disasters which may occur during convalescence or later, influencing primarily the utility of the eye, and secondarily very likely the life of the patient. The secondary effect is to be qualified by the expression "very likely" for the reason it is difficult for a physician to estimate the resistive and recuperative powers of the old and infirm patient. Metabolic equilibrium is decidedly a minus quantity, and the insult to the general economy resulting from these operations tax the reconstructive powers to their fullest extent.

Not at all infrequently an oculist making inquiry regarding a former patient upon whom he has performed a successful operation for cataract extraction, receives information to the effect "that so and so could see very well, but died within the year; or that while the patients could see very well, their general demeanor had changed decidedly. They never seemed the same."

There is also the question of mental disturbance during convalescence. This ranging from mild delirium to acute mania and affecting a considerable proportion of cataract pa-

*Read before the Philadelphia Polyclinic Ophthalmic Society, meeting of November 14, 1912.

tients at all ages (10 per cent Posey). It is, however, distinctly more frequent in the aged. A variety of theories have been suggested by eminent observers as possible explanation of this condition. Such, for example, as the use of atropin, bandaging both eyes, changed surroundings in a hospital, etc. Not any, however, fully explain the phenomenon, for cases in which atropin has not been used, cases in which only one eye has been bandaged, cases operated upon at home, all have developed delirium. The severest case of acute mania Doctors Posey and Zentmayer have ever seen following cataract extraction occurred in a patient operated upon in his own home.

As illustrative of these after-results, the writer has selected from his work at the Chester Hospital eight operations, upon patients eighty years of age or above. They are all impressive of the severity of this procedure upon the individual's subsequent life history, in certain instances the extreme shock lasting for months and finally terminating in death.

Patient 1.—Mc., age past seventy-nine years. Successful extraction following a preliminary iridectomy. Five days later slight paralysis of the left arm, which cleared up within ten days. Patient returned home in two weeks. A few days later he developed a partial Bell's palsy, which disappeared in from two to three months. At this time vision with correction was 6/15. Reduced four months later to 6/60, due to a faint macular hemorrhage. This gentleman before operation was a nervous, high-strung, energetic person for his years. He followed the occupation of court crier. Subsequent to this interference he remained a complete physical wreck, never able to resume his former employment, and died nine months later from cerebral apoplexy.

Patient 2.—H., age eighty-six years, a quiet, mild mannered gentleman, extremely deaf. Operation successful. During convalescence, becoming mildly irrational, patient attempted to remove bandages. He was gently restrained, but objecting so actively and promising not to disturb his dressings he was released. During an unguarded moment patient slipped his finger beneath the bandage, rubbing the eye, completely destroying the organ. Patient returned home later profoundly shocked, from which he never recovered, dying of cerebral apoplexy within a year.

Patient 3.—Mrs. Mc., age seventy-nine years past; diabetic. Preliminary iridectomy; operation successful. Death ensued three days later, due to an uncontrolled vomiting followed by hemorrhage from the stomach. The additional shock to her already unbalanced nervous system undoubtedly hastened the fatal termination of her primary malady.

Patient 4.—Mrs. S., age eighty-seven years. Operation only partially successful. Immediately following the corneal incision the lens was extruded, followed by a large amount of fluid vitreous. The eye was bandaged and patient returned to bed. Twelve hours later patient suddenly developed an attack of acute mania. Getting out of bed, upsetting a glass top table and seizing a bed-pan, patient attempted to clear out the hospital ward, biting, kicking and yelling loudly. It required the combined efforts of two doctors and two nurses to return her to bed. Subsequently she was kept more or less under the influence of hyoscin. For three days she resolutely refused food and drink. Retained her urine thirty hours until catheterized. Bowels did not move for five days. It was only possible to administer medication hypodermically. During the above attack patient made no effort to injure her eye. Patient was encouraged to sit up on the third day and returned home in two weeks. Wound healed. Vision, fingers at one foot.

This woman, an active, energetic person, possessing an unusually fine flow of language, suddenly seized with the powers of a demon during her mania, was reduced to a profoundly shocked, limpid old woman, who at the present writing (three months since operation) is entirely bedfast.

Patient 5.—Mrs. D., age eighty-six years, very deaf and confined to the use of a rolling chair. Operation successful upon O. D., resulting in vision 6/15 with correction. O. S. destroyed. During an unguarded moment, while mildly irrational, patient attempted to get out of bed, striking the eye on some projecting object. Three years later (age eighty-nine years), vision in O. D. reduced to 6/30, due to arteriosclerotic changes. (Since died of cerebral apoplexy.)

Patient 6.—Mrs. B., age eighty years. Operation successful. At the time of the first dressing patient, being in a highly nervous state, forcibly closed the eye. The iris became incarcerated in the reopened wound, requiring later an iridotomy.

The iris incision being a little too long produced a marked dazzling. Patient for succeeding two to three years has remained a profoundly shocked and greatly depressed individual.

Patient 7.—Mrs. Mc., age eighty-six years. Operation successful. During convalescence patient, becoming mildly irrational, removed the bandage three times during the first twelve hours. Patient allowed to sit up on the second day and returned home on the ninth day with a perfect result. Four weeks after operation, vision equaled 6/5 partly, with correction.

Out of the entire series of eight operations only two can be considered successful in their ultimate results. In one, however, patient 5, the vision was greatly reduced after the lapse of three years. The other, patient 7, is too recent—three months at the time of reporting.

The above is not to be taken as contraindicating operative procedure under certain circumstances. The writer feels, however, that the operation for cataract extraction is a far greater shock to the general economy of the aged, even to the point of lessening the length of life, than we are perhaps willing to admit. It should, therefore, be taken as a warning not to be too aggressive. Consequently, if these old patients can get about with a fair degree of comfort, noninterference reflects the best judgment. For at most our efforts are only temporizing in dealing with a decidedly faulty human organism.

Regarding the question of submitting these patients to two operations by performing a preliminary iridectomy, the writer rather favors this method as possessing certain advantages, viz., it affords, in a measure at least, an opportunity to learn how both the patient and his tissues act under such interference.

VI.

RELATION OF GENERAL ARTERIOSCLEROSIS TO CERTAIN OCULAR CONDITIONS.*

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Cases referred to me by ophthalmologists because of some possible general underlying lesions have excited my interest in the above subject, and it appeared timely to call attention to this interdependence of ophthalmology and internal medicine in this class of cases, both on account of the importance of the subject and with the feeling that, through free discussion thus provoked, both the internist and the ophthalmic surgeon might profit thereby. But I beg at the outset to ask the indulgence of the eye specialist for the many shortcomings that may become apparent in the handling of the ophthalmic phase of the subject by an internist.

We are forcibly reminded of the importance of the theme of general arteriosclerosis from the standpoint of life expectancy by the words of Osler: "Longevity is a vascular question which has well been expressed by the maxim, 'a man is as old as his arteries.' To a majority of men death comes primarily or secondarily through these portals."

And I am certain that the eye men will bear testimony of the profound seriousness of such ocular affections as albuminuric retinitis, choroiditis, glaucoma, etc.

Doubtless the internists will bear with me should a few moments be devoted to briefly recalling some of the fundamental ideas concerning the etiology and pathology of general arteriosclerosis, which may not appear so trite to those

*Read before St. Louis Society of Internal Medicine.

limiting their studies to the subject of the eye, and which may serve somewhat as a guide in the discussion.

And before proceeding farther, general arteriosclerosis is defined by Osler as follows: "A condition of thickening, diffuse or circumscribed, beginning in the intima, consequent on primary changes in the media and adventitia, but later involving the latter two coats. The process leads in the larger arteries to what is known as atheroma and endarteritis obliterans, and seriously interferes with the normal functions of the several organs."

The etiologic factors in the disease are divided into four great classes:

First.—Wear and tear of life. This might further be modified to read, American life. The competition in every avenue of endeavor in our country is so sharp that our American brother, from maturity to the grave, is ever keyed up to the highest tension, throwing thus a constant strain on his vascular circuit, leading to early degeneration and fibrosis of the blood vessels, even should he be temperate in all else. Under this head may also be included heredity, as everything naturally depends on the quality of the elastic tubing used in the construction of each human machine; whereby is explained a man of forty years at times presenting the blood vessels of a man of sixty years.

When Oliver Wendell Holmes was asked how to live to the age of seventy, he replied that a man should begin to pick out his ancestors one hundred years before he was born.

Second etiologic factor—acute infections. In this group we have the explanation of the cases of vascular disease occurring before the fourth decade. First among this group must rank syphilis, then the eruptive fevers, also diphtheria and influenza. Thayer has recently called attention to the vascular lesions consequent on typhoid fever. Tuberculosis and all the chronic infections must also be included in this class.

Third etiologic factor—the intoxications. First, the exogenous, as alcohol, nicotin, lead. R. C. Cabot claims that alcohol does not cause vascular disease, but his position has not been conceded by most of the best authorities. Second, as endogenous toxins may be mentioned the poisons probably resulting from faulty metabolism in gout, diabetes, chronic Bright's disease and obesity. Also the autointoxications and autoinfections from the gastroenteric tract.

Fourth.—Conditions that keep up high blood tension. Said conditions are to be mainly found in overeating, which acts in two ways: first, by keeping the blood vessels constantly over-distended, and secondly, in the process of primary and secondary metabolism substances may be formed in the digestive tracts which are directly toxic.

Clifford Albutt says: "One main cause of rising arterial pressure in middle life is excess of feeding; that is, of food in excess of work and excretion." And Osler adds: "That damage is certain to follow from accumulation of waste and the disproportion between intake, work and output." Those who live mainly on a vegetable diet, as the Indians and the Japanese, are said to be far less affected than meat eaters, as the Europeans and Americans, for instance.

The question as to which is primary, the sclerosis of the vessels or the hypertension, is still in a way sub judice, and we must probably as yet recognize two classes of cases: one in which the hypertension produces a chronic interstitial nephritis which is secondary to an acute nephritis, and the other a class, by far the least common, where the hypertension is secondary to the rigidity and narrowed lumen of the arterial tree and resulting directly from sclerosis.

As to the pathology of the disease, it is generally, I believe, considered to be primarily a degeneration and weakening of the media, favoring aneurismal bulging at the points of weakening, with a secondary proliferation and thickening of the intima, which latter process is, according to Thoma, compensatory to the lesion in the media.

This process in the coats of the vessel wall may also result in calcareous deposits, causing the brittle, pipe-stem arteries; also the proliferating process in the intima may extend into the lumen of the vessel, resulting in endarteritis obliterans, with the consequent disturbances of nutrition in the area supplied by the vessels.

Though arteriosclerosis is a general disease, the arterial circuit is not always uniformly involved. In some cases the brunt of the disease is spent on the heart, in others on the kidneys, the brain, digestive tract, etc., and thus according to the distribution of its ravages arise the various symptoms making up the complex picture of the disease. The end comes to its victims at times suddenly through an acute cardiac dilatation

or an apoplexy, or more gradually with all the long drawn-out symptoms of an uncompensated chronic heart lesion or chronic uremia.

As to the prognosis in this malady we of course must realize that the organic changes in the vessel wall cannot be undone, any more than a damaged valve in the heart can be replaced by a normal one; but much can be done toward arresting and limiting the process by removal of the causative factors. The earlier, of course, the condition can be detected, the better the outlook, other things being equal, for a comfortable and useful life during a number of years; but the point I wish especially to emphasize is that the condition must be recognized early.

This brings us to the subject proper, viz., that the eye is the organ where arteriosclerosis is often earliest manifested, and where it can be most accurately appreciated through study of the eye grounds, and so impressed have the internists and surgeons been with the great value of the ophthalmoscope as a diagnostic aid in the affection under consideration, and in many other maladies, that ophthalmoscopic examinations are now practiced as a routine procedure.

Foremost, of course, among the ocular lesions of general arteriosclerosis ranks retinitis, or the so-called albuminuric retinitis. It is especially in the degenerative form of the so-called albuminuric retinitis, rather than in the inflammatory variety, that arteriosclerosis is most typically manifested, presenting in the ophthalmoscopic picture the thickened, tortuous arteries, at times strapping of the veins, hemorrhages, exudations, degeneration, etc., all of which signs point to a degeneration of the retinal vessels with increased arterial tension, both direct results of the disease.

Harvey Cushing, however, in a paper entitled "Observations on Choked Disc With Especial Reference to the Decompression Cranial Operation," read before the Ophthalmic Section of the American Medical Association, June, 1908, takes the position that choked disc and so-called albuminuric retinitis are practically the same pathologic process, both being produced in the same way, viz., through increased intracranial pressure transmitted along the sheath of the optic nerves, and defends his position as follows:

1. Histologic studies of neuroretinal lesions in nephritis show that it is merely a modified form of choked disc.

2. That a retinal picture typical of so-called albuminuric retinitis may occur in association with brain tumors, and in his series of two hundred cases of brain tumor, eighteen showed the typical stellate figures of albuminuric retinitis. In twelve of them there was no clinical suspicion of nephritis, and, furthermore, relief of the intracranial pressure through decompression in a number of the remaining cases led to a disappearance from the urine of the suggestive renal elements.

3. A number of cases in the medical wards showing typical choked disc, with none of the signs supposed to characterize albuminuric retinitis, have at autopsy disclosed in the brain no lesion other than edema, together with the evidences of advanced renal disease.

4. In a number of patients with nephritis, lumbar puncture, when pressure symptoms have been present, has invariably disclosed a cerebrospinal fluid under increased pressure, and its withdrawal brought about an improved appearance in the eye grounds, only to grow worse again with the inevitable reaccumulation of the fluid.

5. Experimentally the ligation of the nerve sheath distal to the chiasm, with sufficient pressure to obstruct venous return, but not arterial flow, did not produce choked disc, though the veins did become tortuous and engorged. On the other hand, on removal of the ligature and exertion of sufficient pressure on a portion of the dura through a trephine hole over the hemisphere, the ampullated distension of the subvaginal space would quickly occur and the disc promptly become edematous.

Though this position of Cushing is an ingenious one, I should like to ask why, at least in cases of the degenerative form of retinitis, we should go beyond the diseased condition of the retinal arteries for an explanation of the retinal lesion?

Among the etiologic factors of choroiditis, arterial sclerosis does not appear to be mentioned; and yet if, as we have seen, general vascular sclerosis can be responsible for retinitis, it would certainly appear reasonable to assume that it might also be responsible for an inflammatory process in the vascular coat of the eye; and in one case under observation such a cause appeared to be the only tangible one.

Hemorrhages into the vitreous follow rupture of vessels of the retina and choroid in the subjects of general arterio-

sclerosis. As a rule they are not entirely absorbed, but leave fixed or floating opacities.

And now as to the possible rôle of arterial sclerosis in the pathogenesis of glaucoma. There are certain considerations which speak rather strongly for such a relation.

1. According to Priestley Smith, in a careful analysis of 1000 cases, at the age of sixty-five years the chance for development of glaucoma is one hundred times greater than at fifteen years, and almost twice as great at forty-five years, which might equally well be applied to the development of arteriosclerosis, so that the diseases are more or less contemporary as to the age for development.

2. We know, I believe, that glaucoma is directly due to a disturbance between the secretion and outflow of the fluids of the eye, and mainly of the aqueous humor. That the aqueous humor is a secretion from the ciliary body, and especially from its processes, and that, other things being equal, the higher the blood pressure in the ciliary processes the greater will probably be the secretion of aqueous. We know, also, that the principal outlet for the ocular fluids is at the filtration angle through the spaces of Fontana, canal of Schlemm, and thence into the anterior ciliary veins. A blocking of this main outlet of the fluids of the eye is a frequent cause of glaucoma. This outlet in the filtration angle is often blocked in the following way: Through hypertension of the blood vessels the ciliary body and processes are pressed against the root of the iris and thereby carry the iris forward in apposition or adhesion against the periphery of the cornea, thus blocking the filtration angle.

Having thus reviewed the part probably played by general arteriosclerosis in the above mentioned diseases of the eye, the question naturally arises, what bearing should such a relation of cause and effect have on the treatment of these conditions?

Aside from the various operative measures in the eye affections alluded to, the mainstay in the treatment appears to be bichlorid of mercury and iodid of potassium; not only in cases with a luetic element, but also those nonluetic. And while these are most valuable drugs, and doubtless do a great deal of good, yet I desire now to emphasize a second point, which is that all ocular conditions which can reasonably be assumed to be dependent upon general arteriosclerosis should be given

the benefit of a general therapeutic regime along the following lines:

1. When the conditions in the eye are so grave as to threaten the integrity of the organ the patient should be immediately placed at complete rest in bed, with the hope of thereby assisting in the reduction of the arterial tension and thus averting a calamity in the eye as well as in the heart, brain, etc.

2. That if the condition in the eye or general condition be not urgent enough to require complete rest in bed, then the patient should be urged to pursue the even tenor of his way, free as possible from all sources of worry and strain. The strenuous life must be dropped, and while it is not well to enjoin an active man from all occupation, yet he must be taught moderation in work.

At the proper time exercise of a moderate, graduated kind must be insisted on, such as walking, golf, etc., and what is most important, a careful diet. Alcohol, tobacco and meat must at first be denied, and later, at least greatly limited for such patients. Milk, and especially buttermilk, must be taken freely, bringing to mind Metchnikoff's theory of the control of intestinal fermentation in the large intestine by lactic acid products. As to medicinal remedies, iodid of potassium has a double value because, experimentally, it has been stated arteriosclerosis may be prevented if coincidentally with adrenalin iodid of potassium is given. It is thought by some to have an influence in the lessening of arterial tension.

Of drugs having a more direct effect on lessening of blood tension we have the nitrite group, as nitroglycerin 1 to 5 mm. of 1 per cent solution three or four times daily, but though given in large doses, its effect is quite transient. Nitrite of sodium in 1 to 4 grains, and erythol tetranitrate, one-half grain every four to six hours, have a more permanent action.

All these remedies of the group of vasodilators are of course mainly indicated to meet certain emergencies where disaster is threatened by excessive hypertension. In the main, dependence must be had in the management of this class of cases on diet, rest, regulated exercise and careful and thorough elimination.

The allotted time has only permitted the presentation in tabulated form of the observations and results obtained in the twelve cases studied, together with the blood pressure charts of such cases of this group as elucidated especially some of the results obtained.

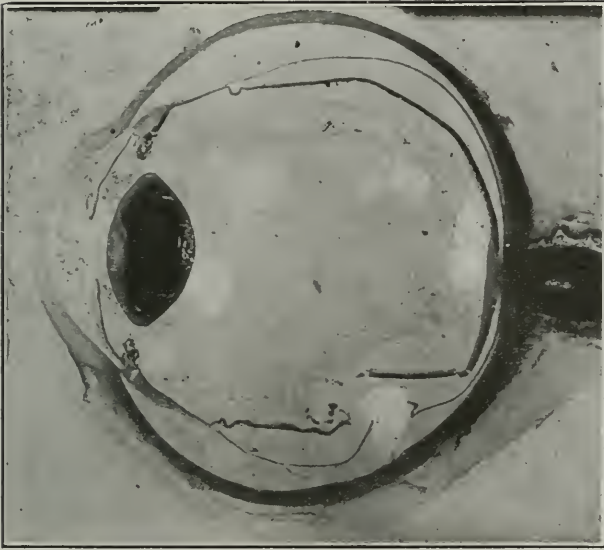


Fig. 1.—Cross section of normal eye, showing relations in filtration angle over spaces of Fontana, canal of Schlemm and anterior ciliary veins. (Kindness of Dr. A. Alt.)

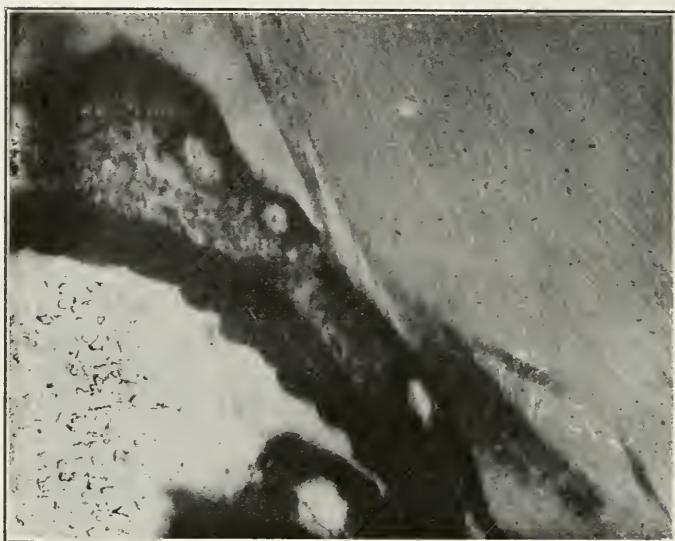


Fig. 2.—Section through glaucomatous eye, showing iris carried forward and in apposition to posterior surface of cornea, with consequent blocking of filtration angle. (Kindness of Dr. A. Alt.)

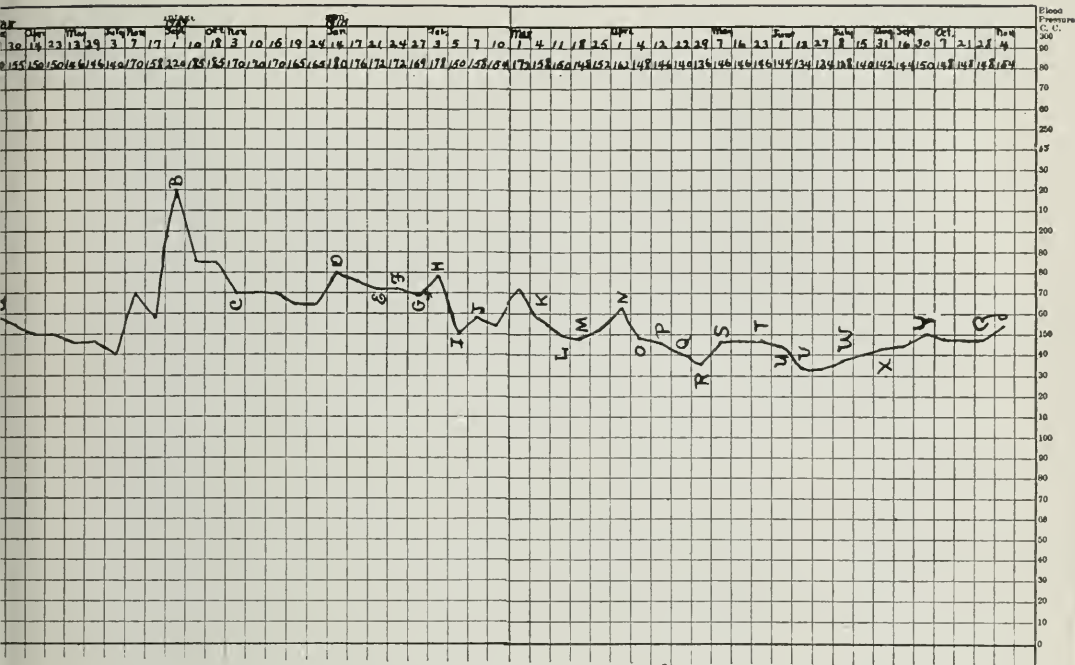


Fig. 3.—Case III. Hyalitis of right eye. Recovery. Later edema of optic nerve and capillary hemorrhage in retina of left eye. Vision increased from 4/240 to 19/240. Great rise of blood pressure on September 1st, 1909, patient having been without treatment since November 17th, 1908.

- A. Bichlorid of Hg., 1/12 gr. Diet and general regime.
- B. No treatment for ten and a half months. NaNO₂ 1 gr. before breakfast.
- C. NaNO₂ 1 gr. three times daily, increased to 2½ gr. three times daily on November 24th, 1909.
- D. No treatment for sixty days. Left retinal edema and hemorrhage. 1/100 gr. nitroglycerin three and four times daily.
- E. Eye much improved.
- F. 1½ gr. NaNO₂ three times daily, increased to 3 gr. three times daily.
- G. Hemorrhage being absorbed.
- H. Eye worse. 2¼ gr. NaNO₂ three times daily.
- I. Eye better. 1½ gr. NaNO₂ noon; 2½ gr. morning and evening.
- J. Still bleeding in left eye. 2¼ gr. NaNO₂ three times daily.
- K. Hemorrhage being absorbed.
- L. Eye doing well. 1½ gr. NaNO₂ at noon; 2¼ gr. morning and evening.
- M. Vision a little better.
- N. Has used eyes more. 3 gr. NaNO₂ in morning.
- O. Fresh hemorrhage in left vitreous; right eye well.
- P. 3 gr. NaNO₂ in morning; 2½ gr. noon and p. m.
- Q. 2½ gr. NaNO₂ three times daily.
- R. Absorption of hemorrhage marked. 2¼ gr. NaNO₂ a. m. and p. m.
- S. 1½ gr. NaNO₂ at noon; 2¼ gr. a. m. and p. m.
- T. Erythrol tetranitrate, 1/6 gr. a. m. and p. m.
- U. Can see at eleven instead of ten feet.
- V. 1/12 gr. erythrol tetranitrate p. m.; 1/6 gr. a. m.
- W. 1/6 gr. again p. m.
- X. 1½ gr. NaNO₂ three times daily.
- Y. Vision better; 1/6 gr. erythrol tetranitrate three times daily.
- Z. Has played a little golf. Erythrol tetranitrate stopped.

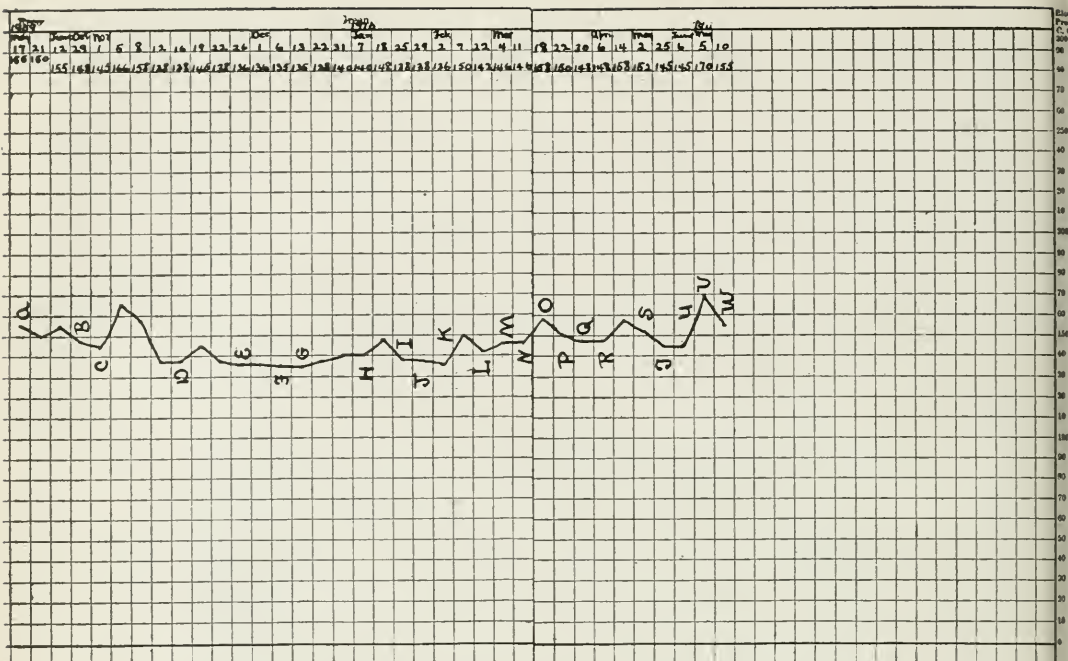


Fig. 4.—Case IV. Hemorrhagic glaucoma. Control of blood pressure, and consequent (or resulting) lessening of edema of ciliary process and retina so lessened pain as to permit of the use of eserine and pilocarpin. November 24th, 1913, glaucomatous eye quiescent and comfortable. Enucleation prevented, other eye normal.

- A. Bichlorid of Hg., iodid of potassium gr. 5. General regime.
- B. NaNO_2 $\frac{1}{2}$ gr. begun on October 26th, 1909.
- C. NaNO_2 1 gr.
- D. Eye much better.
- E. Pilocarpin not painful. Standing local treatment well. 1 gr. NaNO_2 three times daily.
- F. Pupil responds to pilocarpin.
- G. NaNO_2 stopped.
- H. Control of pressure seems to lessen edema of retina and ciliary processes which is cause of pain in use of eserine and pilocarpin. NaNO_2 1 gr. daily.
- I. Eye much more comfortable. Taking 2 gr. NaNO_2 since January 20th, 1910.
- J. Eye doing well. 1 gr. NaNO_2 three times daily.
- K. Eye comfortable.
- L. No NaNO_2 since February 7th, 1910. Take again 1 gr. three times daily.
- M. Eye much better. Taking 2 gr. NaNO_2 three times daily.
- N. Doing well.
- O. Under a great strain.
- P. Eye doing fairly well.
- Q. Eye better.
- R. Some keratitis again, due to excitement.
- S. 2 gr. NaNO_2 twice daily since last note.
- T. 2 gr. NaNO_2 a. m. and 1 gr. p. m.
- U. No pain in eye now.
- V. Recovery from a series of epistaxis. Saturated solution of potassium iodid, 5 gts., three times daily.
- W. No more epistaxis. Reduced iodid to twice daily.

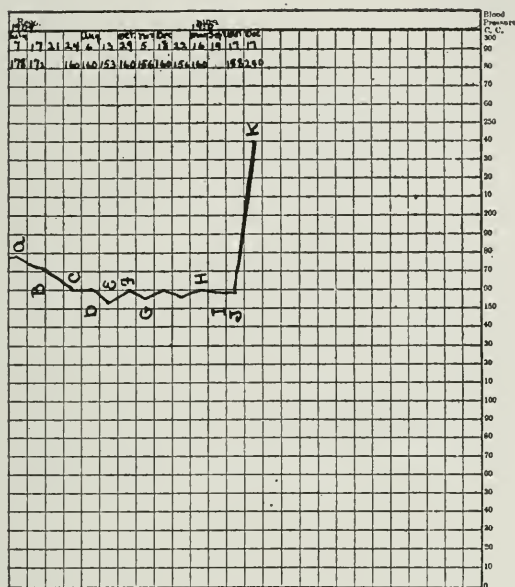


Fig. 5.—Case V. Albuminuric retinitis and retinal hemorrhage showing control of blood pressure and symptoms for a period of one and one-half years, until onset of uremia about December 17th, 1910, followed shortly by death of patient.

- A. Corrosive sublimate 1/24 gr. three times daily. General regime.
 - B. No fresh hemorrhages, old ones being absorbed.
 - C. Two small retinal hemorrhages have disappeared but large temporal one is unchanged.
 - D. Absorption of hemorrhages continues, can now read another line of test letters.
 - E. Vision has all cleared up, can play a little golf.
 - F. No fresh hemorrhages. NaNO₂ 1/2 gr. twice daily.
 - G. Little detached blood pigment in vitreous.
 - H. Exudation in eye being absorbed.
 - I. Played golf for two months, slight edema in ankle.
 - J. Nausea for a week. Uremic.
 - K. Marked nausea, fresh hemorrhage into left eye, impaired vision.
- NaNO₂, 1 1/2 gr. a. m. and p. m.

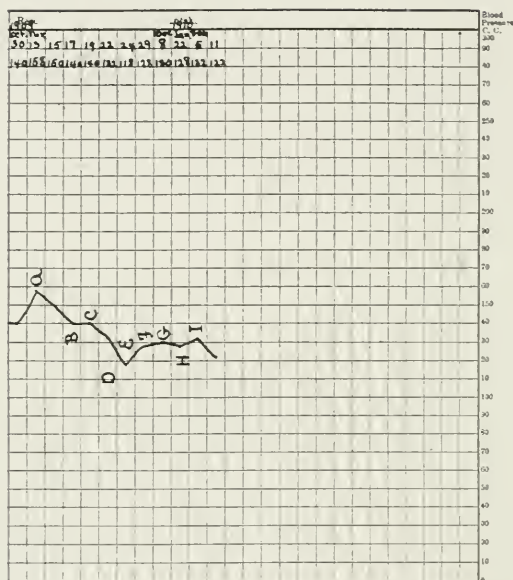


Fig. 6.—Case VI. Retinal hemorrhages. Continued and marked improvement under lowering of blood pressure.

- A. 1 gr. NaNO_2 two times daily. General regime.
- B. Vision better.
- C. Vision improving.
- D. Test of vision shows improvement.
- E. Eye better. 1 gr. NaNO_2 in a. m.; $\frac{1}{2}$ gr. p. m.
- F. Vision better. 1 gr. NaNO_2 a. m.; $\frac{1}{2}$ gr. p. m.
- G. Continued improvement of vision. No NaNO_2 since December 4th.
- H. 1 gr. NaNO_2 each morning.
- I. Eyes doing well. 1 gr. NaNO_2 in morning stopped at this date.

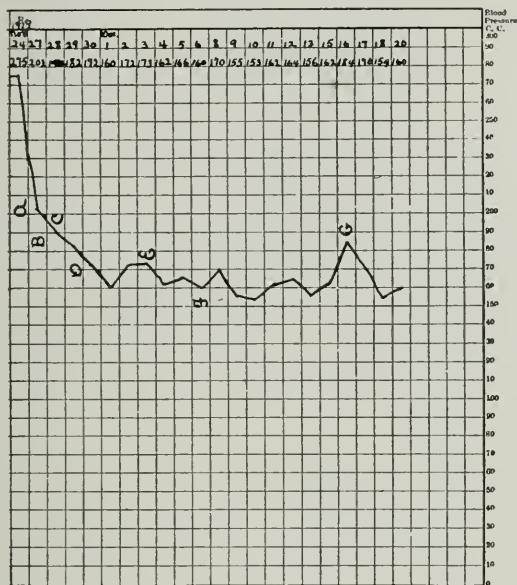


Fig. 7.—Case XII. Retinal hemorrhage (right). Threatened apoplexy averted and retinal hemorrhage controlled by prompt and complete rest in bed and free purgation without use of any of the remedies of the vasodilator group.

A. Severe headache. Absolute rest in bed. Capsule of podophyllin, aloes and colocynth. Salts in morning. General regime.

B. Acetanilid, sodii bromid and caffein.

C. No headache during day.

D. Patient up in chair for a short while.

E. Patient out for a walk.

F. 5 gtts. potassium iodid three times daily.

TWELVE CASES STUDIED, IN TABULATED FORM.

Case Name Date	Sex Occupation Age	Earliest Symptoms	Blood-pressure.	Diagnosis	Treatment	Result
No. I E. B. A. March 16, 1907.	Male, Lawyer, 64	Flashes of light before eyes, followed by flakes of soot.	Sys. Pres., March 2, '07, 140 mm. Sys. Pres., 10-day 200 mm.	Arteriosclerosis. Hemorrhages into vitreous.		No definite increase in eye lesion. In June, 1912, cerebral thrombosis with hemiparesis; now slowly convalescing.
No. II G. P. W. Nov. 29, 1907.	Male, Retired 77	August, 1905. Slight evanescent hemiparesis followed in twenty days by hemorrhagic glaucoma.	Nov. 29, '07, Sys. Pres. 170 mm.; going to 240 mm. Dec. 12; now about 180 mm.	Retinal hemorrhages, hemorrhagic glaucoma, arteriosclerosis with cardiac compensation failure.	General plan in all cases included hygienic treatment; prevention as far as possible from all strain, mental and physical; removal from the strenuous life; forbiddance or limitation of alcohol, nicotine and overeating, especially of the protein articles of diet; plenty of water; regulated exercise.	Loss of right eye. Renal hemorrhages now in last stages of myocardial degeneration.
No. III A. E. July 3, 1908.	Male, Bus. Man, 65	Dimness of vision. Floating bodies before eyes. Threatened apoplexy.	Sys. Pres. 200 mm.	Opacities in vitreous (right). Hemorrhages into and degeneration of retina (left). Arteriosclerosis.		Saving of right eye, loss of left through retinal degeneration. Prevention of apoplexy.
No. IV M. H. S. May 17, 1909.	Female Nihil 66	Film over right eye.	Sys. Pres. 155 mm.	Retinal hemorrhage. Hemorrhagic glaucoma. Arteriosclerosis.		Hemorrhagic glaucoma developed in July, 1909, with loss of vision in right eye; other eye remains in fairly good condition.
No. V A. C. F. July 7, 1909.	Male, Lawyer, 52	Dimness of vision.	Sys. Pres. 178 mm. Dias. Pres. 148 mm.	Hemorrhages surrounding right disc and several small vessels kinky in outline. Arteriosclerosis.		Death from uremia. Many of the blood splashes in retinae were absorbed in the autumn of 1909.
No. VI D. P. D. Oct. 30, 1909.	Female, Nihil, 70	Disturbance in vision.	Sys. Pres. 140 mm.	Retinal hemorrhage in right eye. Arteriosclerosis.		Improvement in eyes.

No. VII A. M. L. Dec. 16, 1909.	Female, Nihil, 63	Specks and sparks before eyes, espe- cially left.	Sys. Pres. 160 mm.	Hazy vitreous. Strapping of retinal veins. Arteriosclerosis.	Result unknown.
No. VIII D. L. Nov. 19, 1909.	Female, Nihil, 70	Disturbance of vis- ion.	Sys. Pres. 138 mm.	Choroiditis and incip- ient cataract. Arteriosclerosis. Incipient cataract.	No improvement ex- pected.
No. IX L. L. S. Sept. 19, 1910.	Male, Retired, 54	Disturbance of vis- ion. Nerves are atrophic and very dark.	Sys. Pres. 180 mm.	Retinitis pigmentosa of fifteen years' duration. Arteriosclerosis.	Drugs: potas- sium iodide and vasodilators, free purgation. Slight increase of trou- ble, May 26, 1911.
No. X L. J. J. June 19, 1911.	Male, Retired, 73	Sudden loss of vision in right eye; ten days later in left eye.	Sys. Pres. 168 mm.	Hemorrhage into sheath of optic nerve (right), and later into left. Venous stasis and edema of both retinae.	Blindness from atrophy in both retinae.
No. XI W. K. Oct. 1, 1912.	Male, Clerk, 55	Failing vision in right eye.	Sys. Pres. 175 mm.	Anterior uveitis in both eyes. Arteriosclerosis.	Absolute rest in bed for a more or less prolonged period in serious urgent cases. Some improvement.
No. XII C. R. J. Nov. 24, 1912.	Male, Druggist, 53	Glasses he was using became ineffective. Severe headache. Threatened apoplexy	Sys. Pres. 215 mm. Dias. Pres. 170 mm.	Retinal hemorrhages. Arteriosclerosis. Swelling of nerve-head.	Retinal hemorrhage ab- sorbed. Subsidence of swelling in nerve-head. Sight much better.

Summary.—Sex: Males 8, females 4. Age: Youngest 53; eldest 77. Occupation: Business men 6, lawyers 2, nihil 4. Earliest symptoms: All ocular; blood pressure high except in Case VIII, which was in early stage. Diagnosis: Hemorrhage into retina 7, hemorrhagic glaucoma 2, hemorrhage into vitreous 1, retinitis pigmentosa 1, choroiditis and incipient cataract 1, hemorrhage into sheath of optic nerve of both eyes 1. Results: Improved 4 cases or 50 per cent; markedly improved 2 or nearly 25 per cent; prevention of enucleation 1; incipient cataract 1; result unknown 1; some increase of trouble 1; loss of vision in one eye 3 (2 of glaucoma and 1 of retinal degeneration); loss of vision in both eyes 1; death from uremia 1.

ABSTRACTS FROM ENGLISH OPHTHALMIC
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**The Methods of Cataract Extraction Practiced in the Rogue
Hungarian University Eye Hospital No. 1, Budapest.**

DE GROSZ, ÉMILE (*The Ophthalmoscope*, October, 1913), gives his method of cataract extraction, based on an experience of 10,000 cases. He is firm in his conviction that it is in the patient's interest to wait until the cataract is mature. He believes also the prognosis in overmature cataracts is not so good as in the mature. Cough, difficulty in breathing, or sugar in the urine are not of so much importance as they were considered in the past. Age does not matter. Bacterial investigation of the conjunctival sac he holds of the greatest importance. Especial respect being paid the pneumococcus. The sac is flushed with 1/10,000 mercury oxy-

cyanid, or 10 per cent solution of argyrol is instilled three times daily. Should this fail, a 2 per cent solution of silver nitrate is employed. Blepharitis is treated with 10 per cent novoform ointment. Cases of dacryocystitis were formerly treated by extirpation of the sac, but lately "in order to prevent abscess of the lacrimal sac and to insure free passage, Dr. Louis Polgák cuts the nasolacrimal duct endonasally and opens the lacrimal sac from the nose." On the second day after his reception at the clinic the patient is taken to the preparation room, where the nurse washes the eyelids and lashes and adjacent parts with neutral soap. Twenty minutes before the time of operation one drop of a 5 per cent cocain solution is instilled, followed by one drop at intervals of five minutes, the last drop immediately preceding the operation. A single instillation of 1:1000 adrenalin chlorid solution follows. Finally wash out sac with 3 per cent solution of sterile boric acid. The patient walks to his bed after the operation is over. The operator stands on the right side of the patient. To sterilize the instruments they are placed in a metal box and submitted to a temperature of 150° Celsius for half an hour in a Luer sterilizer. Conjunctival flap is included in the incision, and capsule forceps used to remove a large piece of the anterior capsule. The dressing consists of boric lint and two pledgets of wadding to the eye, held in place with strips of sticking plaster. The Arlt bandage is used the first day. Both eyes are bandaged for twenty-four hours, after which time the unoperated eye is allowed to go unbound. If the patient is restless, the bandage is removed from the unoperated eye after twelve hours. Six hours after the operation the patient is allowed to sit up in bed, and should his back ache, he is allowed, twelve hours afterwards, to sit in an arm chair. Patients are never kept in bed longer than twenty-four hours. The eye is protected against the reopening of the wound by means of the Fuchs lattice appliance, which is applied on the second day after the operation. Patients usually remain at hospital about two weeks.

W. R. P.

Trephining in Glaucoma—Acute and Chronic Miscellaneous.—
(Concluded.)

ELLIOTT, R. H. (*The Ophthalmoscope*, October, 1913). In this portion of his continued article the author considers: The best shape to give to the sclerostomy wound; the nature, sig-

nificance and importance of the so-called postoperative iris met with after trephining; and some causes of failure after trephining.

The round opening of the trephine is favored for the following reasons:

1. The ultimate size of the scleral wound should be reduced to the minimum consistent with the establishment of permanent and efficient filtration. By using a trephine, we can effect our purpose with an aperture which in no diameter exceeds 1 mm. or 1.5 mm. It will hardly be contended that the breadth of a sclerectomy wound can be reduced appreciably below this limit, whilst by any other method the length of the wound must be several, if not many, times as much as this. Moreover, for any definite length of incision made, a circular wound obviously gives the maximum possible surface area.

2. It is inadvisable temporarily to make a larger wound in the sclera than that of which we intend to avail ourselves for the purpose of permanent filtration. If we do so, we thereby unduly weaken the ocular tunics, and so deprive the contents of the eye of their wonted support at the critical stage of the operation. The circular trephine hole alone fulfills this condition and does so in an ideal manner.

3. The shape of the wound should be such that the filtering channel obtained is not likely to be encroached upon during the process of healing. It is obvious that the ends of an elliptical wound would tend to become shortened by the union of adjacent raw surfaces, whilst the equidistance of all parts of the circular trephine wound will tend to keep the wound of its original size, provided always that no inflammatory action is started. In the latter case any wound will fill up and close.

4. In the interests of scientific accuracy of method, we should be able to determine in advance the exact size of the sclerostomy we intend to perform, and to give mathematical effect to such a determination when the time comes to translate it into operative action. This can certainly be done with the trephine. One of the leading instrument makers has recently provided sets of blades in various sizes, which all fit into a single handle, and are packed in a compact case, so that an operator has the means at hand of varying his size of instrument at will.

5. The investing coat of the eye, on the support of which so much depends, should be in no way unduly or unnecessarily weakened. The trephine leaves a clean-cut, straight walled canal of the desired size, of uniform caliber throughout, and running perpendicular to both surfaces of the ocular tunics.

Postoperative iritis is considered under one of three classes:

(1) The commonly occurring postoperative complication usually called "quiet iritis."

(2) An exacerbation, or maybe a continuation of an acute or subacute condition which existed prior to the operation; and

(3) A true septic condition of the wound, due to an accidental contamination at or after the operation.

"Quiet iritis" is thought to have nothing in common with a septic uveitis, due to accidental contamination of the wound at the time of operation. The author puts forward the suggestion that "quiet iritis" is the manifestation of a condition existing before the operation, but unable to find expression until the altered physical condition empowered it to do so. While the iritis will appear more or less frequently, an occlusion of the pupil need not be feared if a solution of atropin be instilled in the eye on the second or third day. It is not necessary to instill the atropin at the time of the operation, and it should never be employed if the iris tissue is plugging the wound, causing a rise of tension. Eserin and not atropin is then called for.

In cases of a continuation of, or even exacerbation of, an acute or subacute condition which existed prior to the operation they should be treated on ordinary lines.

Two explanations are offered of the continuance or increase of the intraocular congestion after operation for glaucoma: (1) The continuance of a septic action which was in existence before the operation, or (2) an accidental infection at the time of operation.

Under the head of "Some Causes of Failure After Trephining" are given: Dislocation of the lens or vitreous body toward the trephine hole. If on the day following the operation the tension is high and a bead is observed bulging into the aperture, it may be that of presenting lens or vitreous on the one hand, or of prolapsed iris on the other. If the prolapse remains opaque while a strong beam of light is focused

on the edge of the cornea from below, it is iris; whereas if the offending mass be opalescent, it may consist of lens or vitreous.

If the increased tension returns immediately after the operation it is probably due to vitreous matter in the trephine opening due to intraocular hemorrhage; if the tension goes up on the second or third day it is probably due to lens matter in the opening. If there has been a displacement of the lens, the anterior chamber will be shallowed in the region of the site of operation.

Treatment.—If the impaction occurs as a result of continued increased tension due to intraocular hemorrhage, delay action until blood becomes absorbed. If the prolapse be iris, do not hesitate to lay back the flap and excise the portion protruding. If the prolapse be lens or vitreous, and in the course of three or four days the prolapse does not disappear, puncture the bead of bulging matter. The author mentions cases in which the prolapsed lens was incised, which led to relief of tension without general opacification of the lens following.

Blocking of the trephine hole by proliferation of connective tissue occurs occasionally, especially in long standing chronic or subacute congestive eyes, the proliferating tissue being derived either from the episcleral tissue lying beneath the conjunctiva or the uveal tissue lying on the deep surface of or projecting into the trephine hole.

W. R. P.

On Some of the Causes of Failure After Elliot's Sclerocorneal Trephining.

STEPHENSON, SYDNEY (*The Ophthalmoscope*, November 1913). The investigation of the causes of failure after Elliot's sclerocorneal trephining has been carried forward from the clinical point of view by Col. Elliot, and from the experimental point of view by Rochon-Duvigneaud, Ducamp and Kümmell. After briefly stating their findings the author presents four cases with abstract of history and microscopic examination.

Elliot "is convinced that the trephine hole may become occluded by the proliferation of connective tissue, derived either from the episclera or from the uvea. He has further pointed out that the trephine hole may be blocked by iris, ciliary body,

suspensory ligament, lens or vitreous making a movement forward when the aqueous has been allowed to escape through the opening drilled in the corneosclera." The experimental work on cats showed that a loss of substance in the sclera or corneosclera, even as large as 2 mm., had become closed with fibrous tissue at latest on the twenty-sixth day after operation, except in cases where entanglement of the iris had put an end to all cicatrization.

Stephenson states that the causes of failure may be roughly classed as (1) septic; (2) hemorrhagic, and (3) mechanical.

1. Septic Failure.—Very few cases are lost from suppuration or acute iridocyclitis, because of the aseptic precautions taken. Late infection, however, has been reported by Wagenmann, Isakowitz, Axenfeld, Kuhnt and others. The length of time elapsing after operation until infection manifested itself extends to fifty-four days after operation (Kuhnt). The filtering cicatrix in some cases becoming abraded, allowed pneumococci present in the conjunctival sac to pass into the eye.

2. Hemorrhagic Failure.—While small retinal hemorrhages may follow decompression by trephine, the risk of expulsive hemorrhage is small, judging from the reasons given by Elliott: (a) The very slight pressure to which the eye is subjected during operation; (b) the small piece of the sclera removed, and (c) the minimal amount of interference with the contents of the eye once the trephining is accomplished.

3. Mechanical Failure.—This cause of failure is associated with occlusion of the trephine hole. The opening is in most instances filled in by connective tissue, but if an iridectomy has been done the lens capsule or the lens itself may become adherent to the wound, presenting an obstruction to filtration. The latter condition, usually brought about by subluxation of the lens itself, may be due to the following causes:

(1) The inexpertness of the surgeon.

(2) Intraocular hemorrhage pushing forwards the vitreous and with it the lens.

(3) Extreme laxity of the fibers of the suspensory ligament, allowing the lens to tilt and to move bodily towards the trephine hole (Elliott).

(4) Delayed formation of the anterior chamber, so that when iridectomy has formed part of the operation the capsule

of the lens becomes adherent to the lip of the wound by plastic exudation, and when the anterior chamber reforms, the lens is pulled out of place by traction.

The specimens described by Stephenson present the following causes of failure:

No. 1.—Partial blocking of trephine hole (in which no attempts at repair are visible) by ciliary body and subluxated lens; an accident probably due, in part at least, to intraocular hemorrhage.

No. 2.—Blocking of the trephine aperture by connective tissue, and incarceration of the iris in the wound.

No. 3.—Blocking of the trephine holes, of which the eye contains two. Subluxation of the lens and impaction of the capsule in one of the trephine wounds. The other trephine wound is occluded by adherent iris as well as by connective tissue.

No. 4.—Iridocyclitis, possibly connected with the scleral disc left in the anterior chamber at the time of operation. Subluxation of lens and adhesion of the latter to wound in capsule of the eye, itself occluded by new-formed fibrous tissue.

In cases that are clean cut, kept free from irritating epithelial or bacterial substances, with the posterior surface bathed in the bland, nonirritating aqueous humor, healing of the wound should take place with the formation of a filtering cicatrix, inferred from the aperture, which may be recognized, and from the fact that the tension remains normal or subnormal. The complications that interfere with the formation of this permeable cicatrix are such as frequently follow intraocular operations, as entanglement of the iris, ciliary body, lens and capsule of lens. In clean successful cases the recognition of the new-formed tissue fibers from corneal fibers is difficult, whereas in cases where the opening has become plugged the new-formed tissue usually presents particles of pigment derived from the iris which renders simple its recognition.

Three of the cases described showed with the microscope such definite signs of iridocyclitis as posterior synechiæ, occlusion of the pupil, iris bombé, deposits on the cornea, and lymphocytic exudation into the anterior chamber and elsewhere.

W. R. P.

The Pathogenesis of Sympathetic Ophthalmitis.

DEUTSCHMANN, FRANZ (*The Ophthalmoscope*, Vol. XI, No. 11, November, 1913), gives new support to the theory of Leber and R. Deutschmann, according to which transmission of the exciting agent of sympathetic ophthalmia occurs by way of the optic nerve sheaths. By inoculating the eyes of rabbits and monkeys with particles of the uvea and optic nerves from sympathetic human eyes, he has succeeded in producing in these animals the true anatomic findings of sympathetic ophthalmia. The symptoms of leptomeningitis, described from clinical observations by Pflüger, Blaschek, de Wecker, Snellen, Galezowski and others, are explained by the finding, upon microscopic examination of these animals, of minute foci of granulation and induration in the arachnoid about the base or the convexity of the brain. These granulomata belong in the same category as the granulomata found in the uvea and are characterized by "endothelial proliferation in the arachnoid, infiltration of round and plasma cells, which at times caused an exudate into the subarachnoidal space, new vascular formation with tendency to ecchymosis beneath the arachnoid, and in one case polynuclear leucocytes and giant cells." Notwithstanding the fact that the disease is thought to progress through hematogenous metastasis, as shown by the distribution of localized discrete foci of infection in the arachnoid, the heart's blood, at postmortem, was found to be sterile in all cases considered in this series of experiments, and the author holds that "the eye can become anaphylactically diseased, and that such uvea is in the condition to act as antigen."

The organism found in five out of twelve sympathetic eyeballs examined was a Gram positive diplococcus with a marked halo which made its detection simple. However, the organism was never found in the epithelial nests at the point of suppuration, but singly and isolated. This rare appearance assured to them a certain pathogenicity, since avirulent bacteria are quickly removed by the natural protective powers of the organism. Enucleation of the injured eye will remove the greater part of the bacteria, and those in the course of the lymph vessels already on the way to the other eye are impeded in their progress by the rapid flow of lymph from the brain towards the stump of the enucleated eye.

The result of his experiments and investigations on the pathogenesis of sympathetic ophthalmia he summed up as follows:

1. I have succeeded, by inoculation with particles taken from the choroid of a human eye affected with sympathetic ophthalmia, in producing genuine sympathetic ophthalmia in monkeys and rabbits.

2. I believe that the exciting cause of sympathetic ophthalmia is a Gram positive diplococcus; possibly a modified sarcina.

3. The second eye becomes diseased when the bacteria succeeds in passing from the first eye into the lymph channels of the first optic nerve, past the optic chiasma and through the lymph spaces of the second nerve into the orbit.

4. The course of the bacteria passing from the eye into the optic lymph spaces is a twofold one: either direct from the choroid into the intervaginal space, or along the anterior ciliary vessels from the eyeball, around it, within the musculature of the orbit, and eventually back of the eye along the central vessels into the spaces of the optic nerve, and vice versa.

5. The chronic inflammatory changes in the meninges consist of circumscribed foci, and cause no general symptoms.

W. R. P.

Some Commonplaces With Regard to Plastic Operations.

RIDLEY, N. C. (*The Ophthalmoscope*, Vol. XI, No. 11, November, 1913), mentions some of the difficulties of plastic surgery and outlines his methods of procedure. He assumes observation of the general principles of asepsis, immobility and good apposition, and states that sepsis is the greatest cause of difficulty in plastic operations about the face. He advances the theory that "ankyloblepharon is useful in certain bad corneal ulcers and more especially in the threatened necrosis in the severe proptosis of Graves' disease, as we know the nutrition of the cornea is carried out by lymph conveyed through the channels and spaces of the substantia propria from the vessels of the circumcorneal zone. This lymph must have some force to propel it along and to distribute it, and its otherwise sluggish current is, to my mind, greatly assisted by the continuous massage produced by the movement of the lids over the cornea."

In repairing a torn upper eyelid, careful attention should be paid to the union of the levator palpebræ superioris and to Müller's muscle, as well as to the edges of the conjunctiva and lid margins. Simple suture of the lower lid, on the other hand, gives usually a perfect result. If the part be completely torn off, it should be replaced. If part of the lid be missing, the ragged remains must be carefully brought together, and, if necessary, a skin graft added. A notch, as from a tear or cut in the middle of the lid, may be much improved by making a linear transfixion parallel with the lid margin and bringing the extremities together with a suture, as is sometimes done in slight cases of harelip.

When the whole contents of the orbit have been removed for recurrent malignant disease, the skin of the lid may be dissected back from just beyond the line of the cilia and these flaps tucked in and kept in position by the dressing. They are gradually drawn in and by the uniting of their edges the whole cavity is lined.

In repair of severe contractions of the skin of the face, he advocates the use of grafts of the whole thickness of the skin taken from other parts.

W. R. P.

On a Case of Blindness From Optic Neuritis Without Intracranial Disease in a Pedigree Bull. Several Cases, Probably of the Same Kind, in Other Members of the Pedigree. References to Other Cases of Amaurosis in Domesticated Animals.

NETTLESHIP, E., AND HUDSON, A. C. (*The Royal London Ophthalmic Hospital Reports*, Volume XIX, Part 1, July, 1913). The writers report the history of a young pedigree bull of the Guernsey breed which was perfectly well until he was eleven months old, when, without warning, he became very rapidly and totally blind and remained so without showing any other symptoms whatever until he was killed, three months later. Upon autopsy the brain showed no tumor nor meningitis and was macroscopically normal in all parts. The optic nerves were markedly swollen and opaque, the retinal veins full, and the arteries almost invisible.

In four other bulls of the same pedigree blindness came on at the same age, was permanent and not accompanied by any other symptoms referable to the nervous system.

The fact that all these bulls were related to one another

naturally arouses the suspicion that the disease of the optic nerves was the result of an hereditary disposition analogous to the well known family optic neuritis of the young adult human male.

Several other cases of sudden blindness in animals are also reported, and the writers then proceed to give the literature of blindness among animals, grouped according to cause, as follows: (1) Cases of blindness in animals associated with acute infective or toxic states; (2) cases of food poisoning and poisoning by fungi, etc.; (3) acute or general chronic poisoning by tobacco or leguminous plants; (4) supposed tobacco amblyopia in horses; (5) cases of poisoning with *felix mas* and also with the seeds of some of the leguminous plants used as foods; (6) poisoning with food cake; (7) lead poisoning as a cause of visual defects in animals; (8) blindness from renal disease or loss of blood; (9) cases of unexplained blindness, mostly with nervous symptoms; heredity in some of them.

W. E. B.

Pathology of Obstruction of the Central Artery of the Retina.

COATS, GEORGE (*The Royal London Ophthalmic Hospital Reports*, Volume XIX, Part 1, July, 1913). The patient, a woman of seventy-one years, with mitral stenosis, but no albuminuria nor glycosuria, had sudden loss of vision in the right eye. Six days later she presented a clinical picture of obstruction of the central artery of the retina. Six weeks later glaucoma developed with signs of iritis, and two months after onset of blindness the eye was excised. Pathologic examination revealed a calcareous, structureless, unorganized mass in the central artery at the upper level of the lamina cribrosa. No adhesion to the vessel wall, which is normal in this situation except for partial loss of the endothelium. In front of the obstruction the artery is thrombosed for a short distance, but a lumen is speedily restored by the accession of collaterals; retinal arteries normal and well filled. Above the obstruction the artery is small for a considerable distance, but free from disease of the wall or endarteritis; finally it reattains its normal dimensions and is filled with blood.

The wall of the central vein is partially clothed with a thrombus which extends also into the inferior temporal branch. On the papilla this branch is very small and sclerosed; in the retina

it has normal walls, but is greatly distended, and its course is mapped out by a streak of hemorrhage in the vitreous. Other retinal veins are normal and full of blood. Higher up the nerve the partially thrombosed central vein recovers its full caliber by the entrance of small collaterals. Inner layers of retina atrophic; outer normal; glaucoma secondary to iritis, new-formed vascular membrane on anterior surface of iris, occluding the corneal angle, stretching across the pupil and causing ectropion uveæ.

The writer is of the opinion that the obstructive mass in this case was a true embolism. He refers to the tendency, especially in recent German literature, to doubt the occurrence of true embolism. For the complete demonstration of the embolic nature of an obstruction, Harms demands the following conditions:

1. Proof of the lodgment of the plug in a lumen previously free, and of the absence of primary disease of the arterial wall.

2. The finding of a source of emboli—a cardiac valvular lesion, or disease causing thrombosis elsewhere in the body.

3. That other signs pointing rather to thrombosis than embolism should be absent.

All these postulates are fulfilled by this and also another of his cases to which he refers. With regard to the exact nature of the embolus in the present case, it may have been calcified thrombus formed in one of the cavities of the heart, or a piece of calcareous valve. From its extreme hardness and from the presence of a valvular lesion, the latter explanation, on the whole, seems more probable. There cannot be any doubt, he thinks, that the cellular tissue in front of the obstruction was an organized thrombosis, the occurrence of which in this situation calls for no comment. The great distension of the inferior temporal vein and the occurrence of hemorrhage along its distribution are points of interest in the case, and suggest the explanation that these phenomena are due to hemorrhagic infarction. Whether this condition ever occurs in obstruction of the central artery is an old subject of controversy, and he thinks the present case proves that the condition of hemorrhagic infarction may be imitated by obstruction by an artery followed by thrombosis of the corresponding vein. It is probable that a similar picture will be

produced by primary obstruction of the vein followed by thrombosis of the artery. While the occurrence of true hemorrhagic infarction is quite conceivable, there is at present no unequivocal clinical, and no pathologic, evidence of such a condition.

In reference to the occurrence of glaucoma, he had in a previous paper arrived at the conclusion that the evidence does not seem at present to be sufficient to decide whether there is any true causal connection between obstruction of the central artery and glaucoma. On the whole the probabilities are against it, but the decision must be left to future research. In the present case there was not only arterial obstruction but also venous thrombosis, which possibly may account for the glaucoma, although it is very unusual to find glaucoma following anything but an obstruction of the central vein. The amount of hemorrhage also falls far short of that which is found in primary venous thrombosis. The changes in the anterior part of the eye are not those of a primary glaucoma, but are distinctly inflammatory in type. Evidence seems to accumulate that whatever the cause, signs of iritis are very commonly found in eyes lost from glaucoma following thrombosis. Turning to the literature, he is of the opinion that while in some of these instances no doubt the hemorrhage was slight and possibly unconnected with the glaucoma or secondary to it or to operations performed for its relief, yet the frequency of some form of hemorrhage in so small a group is striking. The material for settling the question of inflammatory versus primary glaucoma is less abundant. The analysis which he makes, if it does not prove that all these cases of glaucoma following arterial obstruction are inflammatory and secondary to venous thrombosis, at least diminishes very greatly the probability that the glaucoma is a mere coincidence. Another point against the idea of coincidence is that the interval between the obstruction and the commencement of glaucoma varies only within comparatively small limits. The present state of our knowledge regarding glaucoma following arterial obstruction may, therefore, be summarized as follows:

1. There is good evidence that the sequence is more than a coincidence.
2. There is evidence that the glaucoma is not primary in

type, but due to inflammation of the iris, with the formation usually of a fibrovascular membrane on its surface.

3. It is not impossible that in some cases the factor underlying these inflammatory changes and the glaucoma is a thrombosis of retinal veins occurring while the circulation is in abeyance, and subsequently, when the circulation is restored, reproducing the conditions which obtain in primary thrombosis of the veins—conditions which are well known to lead not infrequently to glaucoma. In reference to the retinal opacity, he is of the opinion that until more unequivocal proof of edema is forthcoming from the examination of fresh and perfectly fixed material, we must continue to regard the retinal opacity of obstruction of the central artery as due in the main to ischemic necrosis. He appends the literature of the subject since 1905.

W. E. B.

On the Preservation of Visual Field After Obstruction of the Central Artery of the Retina.

COATS, GEORGE (*The Royal London Ophthalmic Hospital Reports*, Volume XIX, Part 1, July, 1913). In a previous paper he pointed out from recorded cases that the preservation of a small field of vision was common after obstruction of the central artery, and that this field was almost always on the temporal side, corresponding, therefore, with an area of retina nasal to the fovea. He suggested, as an explanation, that the small capillary anastomoses connecting the retinal and ciliary systems at the nerve entrance were capable of nourishing a small portion of the retina in the vicinity of the papilla. He now reports six cases which confirm his statement, and he concludes that there must probably be some reason in the distribution of the vessels around the disc to account for the fact that the preserved field always extends more to the temporal than to the nasal side of the blind spot.

W. E. B.

Visible Anastomoses on the Papilla After Obstruction of the Central Artery.

COATS, GEORGE (*The Royal London Ophthalmic Hospital Reports*, Volume XIX, Part 1, July, 1913). The writer adds one more case to the two cases of this condition which had been previously reported.

W. E. B.

Cataract Extraction With Peripheral Iridectomy.

HUDSON, A. C. (*The Royal London Ophthalmic Hospital Reports*, Volume XIX, Part 1, July, 1913). The writer discusses the advantages and disadvantages of the simple extraction and of extraction with complete iridectomy, reviews the development of peripheral iridectomy, and commends the operation as performed by Carl v. Hess. This is the operation which he is doing and his results have been most gratifying and satisfactory. Instead of the capsule forceps, as used by Hess, he opens the lens capsule with the point of the Graefe knife in the course of the cataract section. W. E. B.

Some Remarks, With Statistics, on the Treatment of 1,305 London County Council School Children at Moorfields Eye Hospital.

MOXON, FRANK (*The Royal London Ophthalmic Hospital Reports*, Volume XIX, Part 1, July, 1913). The periods of a child's school life in which inspection takes place, according to the London County Council scheme, are:

- (a) Entrants.
- (b) Age eight to nine group.
- (c) Leavers, age thirteen to fourteen.
- (d) Those cases especially referred by the school teachers.

The writer believes that they should be reexamined at six years, or as soon as the child is able to read. At this age also, he maintains, we should then be catching the squints and myopes near the time of their inception, or at any rate at a more favorable time than is the case if we wait until they are eight or nine years old, or until a time when they show some such pronounced defect as squinting or, in the case of the myope, inability to read the blackboard from the back benches. No doubt, certainly, as regards squints, it would be better still if we could have the child inspected from birth onwards, when we should get all the squints in our net at the very beginning, but this ideal is at present impracticable.

He objects to the adoption of anything less than 6/6 as the standard for normal vision, and feels that if a child cannot read 6/6 and Jaeger No. 1 with each eye, then that child should have a more detailed examination. If there is any doubt about the subjective test, give the child the benefit of the doubt and have it sent for further treatment to the treatment

center. He thinks that the child's card notes or a copy of them should always be sent with him when he is brought to the treatment center.

The following is a brief outline of his method for the reexamination of cases:

"First, all myopes, in which class I include cases of mixed astigmatism, are given their full correcting lenses after careful retinoscopy; a note made of the exact refraction and the vision with correction under atropin; a note is made of the family history, nutrition, etc.; the presence or absence of any fundal or macular change; the presence or absence, and if present the size, of a myopic crescent. If at the time of the first examination the case is obviously one of progressive myopia, or if there is any doubt about its being progressive, then the parent or guardian is asked to bring the child for reexamination in four months' time, also to prohibit the child in the meantime doing any reading, writing, or sewing, and warned that it would be advisable to educate the child with a view to some future occupation which does not necessitate the close application of the eyes. The higher degrees of myopia and any that are considered to be of a progressive nature are recommended for the Special Myope School, where a special schedule for their teaching has been drawn up by Mr. Bishop Harman; it seems that there is need for further schools or classes of this nature, as I find that there are cases recommended by me for special treatment that have not yet obtained it. In addition to this, the London County Council official, who is always present at the hospital, interviews the parent and carefully explains the necessity and advantages of carrying out the treatment ordered, and at the same time repeats the details of treatment; a note is also made of all those cases instructed to return and the time to return for reexamination. A notice is then sent to the secretary of the Care Committee for the district from which the child comes, repeating the above instructions, and finally a note is made in a register kept at each school by the teachers. This latter procedure to insure the correct carrying out of treatment is, of course, adopted for all cases, whether myopes or not, if instructed to return for reexamination. All those myopes who are not considered to be of a progressive type are told to return for reexamination in six months. The parents are also

warned to discourage excessive use of the eyes in close work, such as sewing or reading, bad print in a poor light, and to prevent the child bending over her work with rounded shoulders, cramped chest, constricted neck, and eyes glued to the book, etc.

"After the first reexamination, I have all progressive myopes up again for reexamination every four or six months, and other myopes, with some exceptions, every nine or twelve months during school life.

"Hypermetropes I divide into two classes (in regard to re-examination), namely, those of low or moderate degree with good vision, and those of the higher degrees with poor vision; the former I reexamine in one year, the latter in six or nine months.

"My reason for reexamining these (hypermetropic) cases in what, to some, may seem an unnecessarily short time are—not forgetting that we are dealing with children—because there are but few who do not very soon require the spectacle frames repaired, broken lenses replaced, or a general straightening up of the frames, together with recentering of the lenses; this latter a most important factor when dealing with the astigmatic cases or the higher degrees of simple hypermetropia. If the time for reexamination is fixed at longer than one year, or left to the discretion of the child or parent, it then only too frequently happens that the child is not seen again; it is too long an interval to keep in touch with them—they either forget to return, break their glasses and do not trouble to get them repaired, go to some other district, or leave school."

W. E. B.

Wood Alcohol Blindness.

WOODS, HIRAM (*Journal A. M. A.*, June 7, 1913), summarizes the reported cases, and lays stress upon the difference in the susceptibility of individuals to the influence of wood alcohol. The exact manner in which it affects the central nervous system is not well understood. It has a peculiar cumulative effect: small and repeated doses, while not causing intoxication, often leading to serious results on the nervous system. Two cases are reported: one, resulting from rubbing wood alcohol on the leg muscles, and the other from drinking.

E. S. T.

Rarity of Sarcoma of Sclera.

NELSON, RICHARD M. (*Journal A. M. A.*, June 7, 1913), reports a case occurring in a negro, aged twenty-five years. The tumor was located under the bulbar conjunctiva, below and partly concealed by the lower eyelid. The eye was enucleated, and on examination the growth was found to be a small round cell sarcoma of the sclera. Ten days later a number of enlarged cervical lymph nodes were removed. Five years later there was no recurrence. The general opinion seems to be that abscission of the tumor is not sufficient, but that enucleation must be performed.

E. S. T.

The Significance of Ocular Findings in Estimating Longevity.

POSEY, WILLIAM C. (*Journal A. M. A.*, June 14, 1913), first discusses the question of the significance of the findings in nephritis. As is well known, albuminuric retinitis occurs most frequently in genuine cases of contracted kidney. The process often goes on for many years. It is in this class of cases that the ophthalmoscopic findings are of paramount importance in revealing the general vascular sclerosis. Retinal changes may also occur in diffuse chronic parenchymatous nephritis, though not so frequently. Finally, several cases are well authenticated in which amyloid degeneration was accompanied by retinal changes. While it is generally supposed that retinitis appears in a nephritis of long standing, some authorities believe in the existence of a prealbuminuric retinitis. These observations, however, can hardly be taken in the sense that the retinal changes precede the nephritis. It is much more likely that the findings indicate that the retinitis may occur before albumin is found in the urine. According to Groenouw, a second and more probable explanation of these cases is that albuminuria may sometimes be lacking in contracted kidneys, and if at this stage the patient consults a physician, it is very easy for the latter to mistake the intermittent nonalbuminuric condition for a prealbuminuric stage. Finally, it must be remembered that ophthalmoscopic pictures are in no way characteristic. Retinal changes were found by the following authors: Wagner in 6 per cent of 157 cases; Frerichs in 15 per cent of 41 cases; Lecorche in 22 per cent of 286 cases; Eales in 28 per cent of 100 cases; Miles Miley

in 31 per cent of 164 cases, both acute and chronic; Galezowski in 31 per cent of 154 cases.

Other statistics are quoted to show that the prognosis is unfavorable. By far a greater number of persons so affected die before the retrogression of the retinal changes takes place. In general terms it may be stated that only about one-third of the patients live more than two years after the appearance of retinal disturbance.

The changes in diabetes are of almost equal value. The changes occur in the ciliary muscle, in the lens and in the retina. Prognosis is less serious as regards the life of the patient; it is unfavorable in degenerative diseases of the retina, less so in hemorrhage, while the formation of cataracts cannot be considered as evidence of the rapid progress of the disease. It has been the author's experience that with proper care diabetics may live for many years after development of the ocular lesions, and that in some instances the eye conditions improve. Heart and vascular diseases frequently manifest themselves by retinal changes. The eye changes in paresis are briefly mentioned.

E. S. T.

New Scleral Trephine.

GRADLE, HARRY S. (*Journal A. M. A.*, June 28, 1913), describes a trephine in which by a simple mechanism the trephine itself is rotated by a right angled arm, while the instrument is held in a firm position with the left hand. E. S. T.

Some New Perimetry Instruments.

WALKER, CLIFFORD B. (*Journal A. M. A.*, July 26, 1913). These instruments, which can hardly profitably be described in this connection, consist of graduated discs, a color inter-changer, and a combination blinder and macular selector, and have been used in the neurologic surgical clinic of Dr. Harvey Cushing, Boston, Mass.

E. S. T.

Sarcoma of the Choroid.

BRAY, AARON (*Journal A. M. A.*, August 30, 1913). The patient, a girl of eighteen years, consulted the author on account of failing eyesight, in February, 1905, when the diagnosis of sarcoma of the choroid was made. Enucleation was

refused, but the latter part of May she returned with great pain, and with the tension of the eye $+3$. The eyeball was removed, and a melanotic sarcoma was found at the posterior pole. The patient was seen again in 1912, and was apparently in good health. In January, 1913, after childbirth, a rapidly progressive enlargement of the liver was noticed, and the diagnosis of sarcoma of the liver was made. She died May 6th. No postmortem was obtained, but the author considers that the diagnosis was clear. E. S. T.

Golf-Ball Burn of the Eye.

THOMASON, H. E. (*Journal A. M. A.*, September 20, 1913), reports the case of a boy, aged thirteen years, who thrust his knife into the center of a golf-ball, causing the liquid therein contained to spurt out into the right eye. The case presented the usual features of burn which have been previously described in these cases. He recovered vision of 20/30.

Note.—All cases reported have shown alkaline reaction.

E. S. T.

Three Ophthalmic Questions—Optometry, Conservation, Education.

WOODS, HIRAM (*Journal A. M. A.*, September 27, 1913. Chairman's address at the meeting of the Section of Ophthalmology of the American Medical Association). This important communication, which can only be briefly sketched, takes up three of the serious questions confronting ophthalmologists of today, and will well repay a careful reading. The main questions in connection with optometry are presented, and the importance of continuing the committee work of the section is urged. The general plans of those who are working in the Russell Sage Foundation are mentioned, and the importance of this work is dwelt upon. Finally, the author analyzes carefully the plans of instruction in the different universities, in the preparation for the practice of ophthalmology. E. S. T.

Physiologic Optics the Basis for Teaching Clinical Ophthalmology.

LANCASTER, WALTER R. (*Journal A. M. A.*, September 27, 1913), calls attention to the fact that in the methods of teaching ophthalmology, adequate provision for physiologic optics

is lacking. He dwells upon the importance of refractive errors in many diseases, and thinks that from three hundred to five hundred hours is the minimum for a course designed to cover the essentials. E. S. T.

Some Modern Viewpoints of Glaucoma.

SATTLE, ROBERT (*Journal A. M. A.*, September 27, 1913). The more modern point of view concerns itself with the questions: (1) If in chronic glaucoma the sclerosis of the tissues is the first factor in the pathologic process; (2) if in the acute cases the assumed biochemic intraocular changes must be considered the real dynamic factors. The question is raised as to whether glaucoma is a lymph or blood stasis, or a sudden choking off of both, and retention of greater blood volume. The value of the tonometer is discussed, and some chemical questions are propounded. E. S. T.

Experimental Study of Intraocular Pressure and Ocular Drainage.

SCHOENBERG, MARK J. (*Journal A. M. A.*, September 27, 1913). This valuable paper represents a series of investigations with the tonometer.

(1) Rate of ocular drainage in normal rabbits. Numerous examinations made on the same rabbit have revealed the interesting fact that measurements vary more or less at every examination. In one rabbit, at the first examination, the tonometer having been kept applied on the right eye, the intraocular pressure gradually fell 9 mm., and on the second examination it went down 20 mm. of Hg. in 540 seconds, etc. The same kind of apparent irregularities in the measurements of ocular drainage was obtained in ten rabbits. It seems logical to expect that the same tonometric weight, applied on the same eye, should reduce a constant amount of intraocular pressure in a given number of seconds, but this was not found to be the case.

(2) Possible relation between the intraocular pressure of both eyes. The author's experiments have been made by measuring the tension in both eyes before and after massage or suction has been applied in one eye only. He found that the suction and massage reduce the pressure in eyes with a normal tension. In such eyes, suction of one eye very frequently reduces the pressure of both eyes. Rarely the pres-

sure remains the same, or becomes a little higher in the non-treated eye. In glaucomatous eyes suction seems to have little influence. Tests made on two cats, under ether, showed that heavy pressure and massage exerted on one eye does not change the pressure in the other eye.

(3) Experiments and clinical examinations regarding the existence of reflex action of some distant organs on intraocular pressure. The series in which the pressure was measured, before and after the operation, is tabulated. The author thinks a number of cases must be observed before any conclusion regarding this question may be reached.

(4) Relation of intraocular pressure and drainage to the tonus of the extraocular muscles. It is a well known fact that external pressure on the eyeball raises the intraocular pressure. During the time the tonometer is applied to the eye, the slight pressure of the finger or a faint attempt to close the lids is sufficient to modify the tonometric measurement, and a high pressure is recorded. Intraocular pressure decreases following tenotomy of the ocular muscles. This can be explained by the section of ciliary vessels and bleeding during the operation, the action of cocaine, or the retraction of the muscles and the temporary suspension of their pressure on the eyeball.

(5) Rate of drainage in human eyes with normal intraocular pressure. A table of the rate of diminution of drainage in the eyes of fourteen patients is given. Considerable variation is shown. In one patient the pressure went down from 26 to 10 in 120 seconds, while at the second examination it decreased from 26 to 18.5 in 120 seconds. The rate of drainage is probably smaller in eyes with a normal high pressure near 26 mm.

(6) Rate of diminution of intraocular pressure in glaucoma. Nine cases were examined and the pressure did not recede when the tonometer was kept constantly applied on the eyes for from 60 to 120 seconds.

(7) Ocular drainage in the eyes in which glaucoma is suspected. Four absolute cases were examined. The author reaches the conclusion that the diagnostic value of a so-called intraocular pressure is only relative. In one case a miotic reduced the intraocular pressure in both eyes to the normal limits, while in one eye the ocular drainage became normal.

and in the other it remained impaired. The author summarizes his conclusions as follows:

1. There is always a gradual reduction of the intraocular pressure if the tonometer is applied on a normal eye for a certain number of seconds.

2. The rate of reduction of intraocular pressure varies not only in various eyes, but also in the same eye if taken at different periods.

3. Experimental evidence seems to indicate that changes of intraocular pressure in one eye may often be followed by similar changes of intraocular pressure in the other eye.

4. Neither the experiments on rabbits and cats, nor the examinations in the operating room, give any clue regarding the existence of a reflex or biochemic action starting from some distant region and influencing the intraocular pressure. The extraocular muscles play an important role in the various normal fluctuations of the intraocular pressure.

5. The ocular drainage in glaucomatous eyes differs from that of normal eyes. The slower the rate of drainage the nearer the eye is to an acute attack or to absolute glaucoma; the more rapid the rate of drainage the nearer to a state of compensated glaucoma. A reduction of the rate of ocular drainage may mean latent glaucoma in spite of an intraocular pressure which is within the normal limit (below 26 mm. Hg.).

E.S. T.

Hydrophthalmos, With a Histologic Report of Two Cases, One of Which Presented a Congenital Coloboma.

ZENTMAYER, WILLIAM (*Journal A. M. A.*, September 27, 1913), discusses the symptoms, etiology and pathogenesis of the disease and reports a series of answers to questions to other surgeons as to the favorite method of operation, the percentage of cases showing evidence of inherited syphilis, and the percentage of cases in negroes. An analysis of the replies shows that iridectomy gave fair results in 42 per cent and poor results in 58 per cent of the operators employing it. Iridectomy and sclerotomy are the operations which have been longest employed, and it cannot be said that they have inspired confidence except when performed in the very earliest stage of the disease. The dangers of iridectomy are connected with the sudden release of the intraocular tension in an eye in which the natural barrier between the vitreous and

the wound has been weakened by disease. Sclerectomy has been advised by a number of operators. The Fergus-Elliott method is attended by the least hazard and is easiest to perform. It is inferior to the Lagrange in that the filtration area is not so extensive and the scar is not so well placed for permanent effect. Two cases are reported in detail, and the author thinks that the study of these two eyes lends additional support to the view that the essential factor in the production of hydrophthalmos is an absence or incomplete development of the canal of Schlemm, and that a probable contributing factor is the presence in the angle of the anterior chamber of prenatal connective tissue. E. S. T.

Trachoma, Its Prevalence and Control Among Immigrants.

McMULLEN, JOHN (*Journal A. M. A.*, September 27, 1913). Trachoma is a chronic communicable disease of the conjunctiva, prone to remissions and exacerbations. The diagnosis and prognosis, etc., is the most troublesome subject with which the medical examiner of aliens has to deal. In 1897 the federal government classified it as dangerous, contagious disease, and in spite of the fact that the steamship companies maintain an inspection service abroad, many hundreds of cases are found annually among immigrants, the majority from Russia, Italy, Austria-Hungary, Turkey and Greece. Some statistics in connection with the services at the port of New York are given. In 1911, 1167 cases were certified, while in 1912 there were 718 cases. Any modification of the present classifications by the government would mean the addition to our population of thousands of aliens suffering from trachoma whose emigration to this country is now prohibited. E. S. T.

Trachoma Among the Indians.

SCHERESCHEWSKY, J. W. (*Journal A. M. A.*, September 27, 1913). This paper gives a summary of the results of the examination of 39,000 Indians in the United States. Seventeen per cent were suffering from trachoma, the percentage varying from over 70 per cent of the Indians examined in Oklahoma to 2 per cent of the Indians in New York State. Numerous statistics are given and the bearing of their unsani-

tary methods of living on the prevalence of trachoma is discussed. The following conclusions are reached:

(1) Trachoma is exceedingly prevalent among the Indians, the prevalence being (a) highest in Indian boarding schools, (b) less in Indian day schools, and (c) least among reservation Indians above and below school age.

(2) The origin and duration of the infection among the Indians is unknown, but its wide dissemination is readily accounted for by the housing conditions and want of knowledge of personal hygiene among them.

(3) The opening of reservations to white settlement and the foreshadowed absorption of the Indian by the white population renders the present widespread diffusion of trachoma among the Indians a serious menace to future white populations of Indian reservations.

E. S. T.

Trachoma Among the Natives of the Mountains of Eastern Kentucky.

STUCKY, J. A. (*Journal A. M. A.*, September 27, 1913), had noticed for some years increasing numbers of cases of trachoma coming to him from the mountains of eastern Kentucky, and was finally led to make a trip of investigation through five counties. Serious conditions were found; many advanced cases of trachoma with impairment of vision occur in every locality. The author describes the methods of living and personal hygiene of the people and outlines his methods of clinical work. The problem of eradicating the disease is a serious one. The Kentucky State Board of Health is unable, for financial reasons, to adequately cope with the condition. A semiannual clinic has been conducted by the author in April and September, in connection with the settlement schools at Hindman, Ky.

E. S. T.

Temperature of the Conjunctiva.

HOWE, LUCIEN (*Journal A. M. A.*, September 27, 1913), describes the construction of the thermocouple and the method of using it in connection with the galvanometer. One is placed in the mouth, and the other in the conjunctival cul-de-sac. The couple described measures .015 degree. The temperature of the cul-de-sac is from about .3 degree to about .4 degree Centigrade lower than that of the mouth.

E. S. T.

Blepharochalasis.—Report of Two Cases.

WEIDLER, WALTER B. (*Journal A. M. A.*, September 27, 1913). Blepharochalasis is the name suggested by Fuchs for chronic edema with stretching, thinning and atrophy of the subcutaneous connective tissues. The etiology of the disease is obscure. It occurs most frequently in young girls, and is always limited to the upper lids. Early in the disease the skin of the upper lids is pinkish-red and smooth; later there is atrophy with numerous fine lines. The subcutaneous tissues hang down in a baggy, pouchlike mass, but there is no true ptosis present. One case was operated on and the mass of the subcutaneous fatty tissue with superior lobe of the lacrimal gland was excised. Result was very good. Other local means have proved unsuccessful. E. S. T.

Equivalent Values in Spectacle Lenses.

SHAHAN, WM. S. (*Journal A. M. A.*, September 27, 1913). This paper is a presentation of the advantages of the meniscus lenses. The advantages are so frequently lost because their effective values differ from those of the trial case lenses. These discrepancies can be computed by calculating the advancement of the second Gaussian points and the posterior poles of the lenses from the planes of their rims, and finding the corresponding equivalent dioptric values. These computations with formulæ are given in detail. E. S. T.

Metastatic Ophthalmia.—Report of Three Cases, One of Which Resulted in Recovery of Vision.

WILDER, WM. H. (*Journal A. M. A.*, September 27, 1913). This condition, which has also been called metastatic suppurative choroiditis, is a septic inflammation beginning in the retina and infecting all the other structures of the eyeball.

The first case was a woman of sixty-four years, with general sepsis, thrombosis of one leg, parotitis and cystitis. *Bacillus coli communis* was found in the urine, and the *staphylococcus aureus* in the blood. Death occurred from pneumonia. The second patient was a woman of twenty-five years. She had a severe tonsillitis, followed by a middle ear suppuration. Some weeks after she developed pneumonia, synovitis of the wrist and knee, and finally metastatic ophthal-

mia of the left eye. Streptococci were found in the tonsil, ear and eye. She finally recovered, with the left eye completely shrunken. The third case was a girl of eighteen years, who had diphtheria, followed by streptococcus infection of the tonsils. Both eyes became involved. Subconjunctival injections of salt solution, hot applications, dionin and sodium salicylate were ordered. She gradually recovered with normal vision. Antitoxin had of course been given. The etiology, prognosis and treatment are discussed and the seriousness of the condition is emphasized. E. S. T.

Phlyctenular Ophthalmia and Episcleritis.

WALTER, WILL. (*Journal A. M. A.*, September 27, 1913), recapitulates the different theories which have been presented as to the causation of these conditions. The theory of bacterial infection from without has not been proved. The theory of malnutrition and autointoxication is important and undoubtedly fundamental, but cannot be considered a specific cause. The endogenous infection theory considers latent tuberculosis as the most probable source. Others are the bacillary fragment theory, and the anaphylaxis theory. Six cases are reported, with opsonic index of cases that have had tuberculin injections. E. S. T.

Topical Diagnostic Value of the Hemianopic Pupillary Reaction and the Wilbrand Hemianopic Prism Phenomenon.

WALKER, CLIFFORD B. (*Journal A. M. A.*, September 27, 1913), quotes from the literature the methods of performing hemianopic test, and bases his ideas on the results of twelve cases in the clinic of Dr. Harvey Cushing. His conclusions are as follows:

II.—HEMIANOPIC PUPILLARY REACTION.

(1) Nothing has been noted in these cases in disagreement with the theories of Heddaeus and Hess, that the peripheral retina lacks pupillomotor sensitiveness.

(2) The possibility of hemianopic pupillary reaction within the pupillomotoric area is suggested.

(3) In absolute central scotoma cases the absence of direct pupillary reaction without other cause than the scotoma speaks

for the absolute central involvement of an area at least as large as the pupillomotor area, while the presence of the direct pupillary reaction, when the central scotoma is greater than the pupillomotor area as tested by large discs, requires further tests for light perception as described.

(4) Observations may be complicated by "concentric movement" or other psychic reactions which may sometimes be eliminated by repetition.

(5) Clinically the hemianopic pupillary reaction, in those chiasmal lesions of dyspituitary origin, of rather rapid onset and rapid recovery after operation, has failed, possibly due to a certain retention of pupillomotoric function centrally, after vision for discs has been lost by the hemianopic retina.

II.—THE WILBRAND HEMIAXOPIC PRISM PHENOMENON.

(1) The peculiar distribution of the field defects in anterior and posterior lesions often aids to and encourages psychologic factors which greatly complicate the Wilbrand test.

(2) The presence of pseudorefixation, as demonstrated by the new method described, throws serious doubts on the presence of a definite reflex arc in the Wilbrand prism phenomenon.

(3) Clinically, the Wilbrand test has offered no valuable diagnostic data in the cases.

E. S. T.

Preventable Blindness—A Challenge to the Professions.

GREENE, HENRY C. (*Journal A. M. A.*, September 27, 1913). This article is based on the causation of blindness from the standpoint of the work done by the author, who is field agent for the conservation of eyesight, Massachusetts Commission for the Blind. About 25 per cent of an estimated 118,000 blind are disabled through the failures of three professions—medicine, business, and statecraft—and of one new profession, social service. The problem of preventable blindness lies in the elimination of waste—"the waste involved in fruitless law-making, bungled administration, medical education often unworthy of the name, medical service, here sparse, there prodigal, without avail, a myopic industrial system, and social service, hovering on the outskirts, eagerly interested in immediate needs, but dull to the essential need." Statistics of the causa-

tion of blindness are given, and the characteristics of the diseases in their social aspects are mentioned. The remedies for this state of affairs lie in education, better hospital service, and more adequate arrangements for social service in the following up of cases. The conclusions are given in detail and will well repay a careful reading.

E. S. T.

Apparent Esophoria and Its Relation to Convergence Insufficiency.

LEMERE, H. B. (*Journal A. M. A.*, September 27, 1913), describes this condition as a state of ocular imbalance in which there is an esophoria in the distance and convergence insufficiency for near vision. The convergence insufficiency is the true cause of the trouble, and the symptoms are relieved when the convergence power is strengthened. This may be done either by exercise or by operation. The author uses the tuck operation of Savage with catgut suture, as recommended by Valk.

E. S. T.

Ocular Vertigo.

GREENWOOD, ALLEN (*Journal A. M. A.*, September 27, 1913). A good deal of vertigo of moderate severity is undoubtedly caused by the eyes. The most common cause is obliquity of the axis of astigmatism. Nineteen cases are reported. The author has not seen any cases in this series of vertigo from muscular palsies, nor has he been able to elicit a history of vertigo in patients with heterophoria.

E. S. T.

Is the Percentage of Myopic Eyes Diminishing?

RISLEY, SAMUEL D. (*Journal A. M. A.*, September 27, 1913). This paper is a continuation of the statistics set forth in an article on school hygiene, showing the steadily diminishing percentage of myopia from 1874 to 1893, on account of the correction of anomalies of refraction by ophthalmic surgeons. The author's well-known views, that the increase of myopia in school life is due mainly to astigmatic defects, is mentioned, and tables are given showing the decrease in the amount of myopia from 1894 to 1912. The statistics show unmistakably, that in the author's personal experience there has been a steady fall in the percentage of myopic eyes applying for treatment.

E. S. T.

Postcataract Extraction Delirium.—Report of Eleven Cases.

PARKER, WALTER R. (*Journal A. M. A.*, September 27, 1913), summarizes the history of these cases and mentions the various theories that have been advanced to account for the condition. All agree that heredity plays an important part, and that weakness incident to the operation, or preceding disease is the exciting cause. There is no agreement, however, as to the class of cases which should be included. The following observations are made:

1. The delirium occurred in 0.29 per cent of the cases operated.
2. No patient showed marked signs of mental disturbance while under observation, either before or at the time of operation.
3. One case showed possibility of infection from an old cystitis.
4. The urine was free from sugar, albumin or casts in nine cases. No record was made in two cases.
5. Codein was administered in two cases, one grain hypodermically, immediately after the operation.
6. The possible effects of cocain can be eliminated, as the mental disturbances did not occur in a single case until at least twenty-four hours after the operation, and there was no rise in temperature.

E. S. T.

The Surgical Treatment of a Certain Type of Penetrating Wounds of the Sclera by Means of a Double Conjunctival Flap.

FRANCIS, LEE MASTEN (*Journal A. M. A.*, September 27, 1913), summarizes the advantages of the conjunctival flap in wounds of the sclera, and advocates covering the wound with two flaps. In order to secure a firm healing the conjunctival surface of the underneath flap is carefully abraded by gentle scraping with a knife, so that the upper flap will adhere to it. The following advantages are mentioned:

1. Because of the traction exerted by the two flaps, the scleral wound lips are held in firm apposition. Consequently, relatively large wounds may be rapidly and safely closed without stitching the sclera.
2. The resulting scar is thicker, firmer and more unyielding.
3. Two layers of sound conjunctiva protect the contents of the globe from outside infection.

E. S. T.

Primary Lues of the Bulbar Conjunctiva.

SPRATT, CHAS. N. (*Journal A. M. A.*, September 27, 1913). Statistics show that six or seven out of every one hundred cases of chancre are extragenital. The ophthalmologist rarely meets with this condition. The author has found reported twenty-one cases of chancre of the bulbar conjunctiva; of these three were at the limbus. The additional case, in a nurse-girl, aged thirty-seven years, who had the care of a syphilitic infant, is reported. The symptoms are characteristic and though the diagnosis may be difficult in the early state, at the end of two weeks, when the chancre has developed, the diagnosis is easier. There is marked chemosis, ulceration with induration, and enlargement of the preauricular lymph glands. The diagnosis is made absolute by the demonstration of the spirocheta pallida. The Wassermann reaction is not positive before the third or fourth week. E. S. T.

Artificial Illumination a Factor in Ocular Discomfort.

BLACK, NELSON M., AND VAUGHN, F. A. (*Journal A. M. A.*, September 27, 1913). It seems quite certain that ocular discomfort, the result of exposure of the eyes to the light, and especially that observed during close work, under improper artificial illumination, is the result of muscular fatigue, which in turn is caused by the constant contraction in attempting to protect the retina from too much light. This discomfort is caused much more commonly by artificial light, which is of less intensity than daylight, which frequently causes no discomfort. The authors believe that the evolution of the eye is not as yet completely adapted to artificial illumination. The effect of light on the visual purple is discussed, and a brief description given of the spectra of daylight and common illumination. Glare is also a cause of discomfort, and it is especially desirable that this element should be eliminated by the use of proper paper as well as by the proper illumination. E. S. T.

Some Comparative Measurements of the Skull and Sella Turcica.

POTTS, JOHN B. (*Journal A. M. A.*, September 27, 1913). The author's paper is an effort by means of X-ray measurement to establish the average measurements of the sella tur-

cica, and to demonstrate that these measurements bear no relationship to the intracranial measurements or to the size of the accessory sinuses of the nose. Several tables are given showing considerable variations, and nine cases of various pathologic conditions are reported in detail. E. S. T.

The Incidence of Ophthalmia Neonatorum.

HARMAN, N. BISHOP (*Brit. Med. Jour.*, May 24, 1913). The first official statement on the incidence of this condition in London appears in the report of the Medical Officer of Health of the London County Council for the year 1911. The number of births was 100,830, which gave about 850 cases for the whole year, or an incidence of .843 per cent. The author collected some private statistics in 1906 which gave 110 cases in 12,680 births (.867 per cent). The antiseptics used were: Boracic lotion in 125 instances, mercury perchlorid in 102, silver nitrate in 27, protargol in 1, and mercury biniodid in 1, in the remaining 22 cases sterile water was used. The advantages of legislation for the compulsory use of prophylaxis is discussed, and the author rather inclines to the belief that the routine use of silver in the eyes of the newborn is not desirable. E. S. T.

The Lacrimal Gland in Surgical Anesthesia.

RUTHERFORD, L. T. (*Brit. Med. Jour.*, June 21, 1913). The author's observations are drawn from a series of 200 cases. In the first stage the activity of the glands varies according to strength of the irritation in the nose and tubes, and, if no vapor impinges on the cornea, the canthi may remain dry. With the onset of the excitement stage, the glands become excessively active, and pools of secretion appear at the inner canthi, and from thence overflow onto the face. During the stage of relaxation the glands cease to secrete. In the fourth stage they are still inert. E. S. T.

Miners' Nystagmus.

LLEWELLYN, T. LESTER (*Brit. Med. Jour.*, June 28, 1913). gives a brief account of miners' nystagmus, which he characterizes as an "occupational disease of the nervous system." The question is treated especially from an economic standpoint, and tables are given showing the estimated cost to the country and the disability to the individual. E. S. T.

The Influence of the British Medical Association in the Establishment of Ophthalmology as a Special Science.

BICKERTON, THOMAS H. (*Brit. Med. Jour.*, August 2, 1913). This very interesting address is a historical sketch of the development of ophthalmology in England. The dates of the founding of principal ophthalmic hospitals and societies are noted, and the early books and journals are tabulated.
E. S. T.

Eyesight and Navigation.

FERGUS, FREELAND (*Ophth. Rec.*, August, 1913). The paper deals particularly with the report recently issued by the Sight Tests Committee. The safety of the traveling public is the paramount interest to be taken into consideration. The Board of Trade have a perfect right to lay down what regulations they think absolutely necessary to protect the traveling public, and nobody can blame them if to some extent they err on the side of safety. On the other hand, there are other considerations which, although of less importance, are by no means negligible. Perfect eyesight, in terms of the physicist's definition of it, is by no means common. The bulk of mankind, so far as we know, have not got it; consequently, if men are to be excluded from following the sea because their eyesight does not amount to what physicians and physiologists define as normal vision, then you materially lessen the recruiting ground, not only for the royal navy, but for the mercantile marine. If that goes beyond a certain length then it may greatly hamper shipowners in getting a supply of suitable men to form the crews of their vessels.

Again, it may prevent men who have a strong inclination for the sea and who will not make good landmen, following their natural predilections.

Further, if after a man has entered on a maritime career the eyesight tests are increased in severity, he may, after he has attained that stage of life at which it is impossible to enter on any other avocation, find himself stranded.

Up till the year 1877 there was no examination required as regards color vision. It was only in that year that the Board of Trade issued colored cards and glasses to enable the examiners to make some test of color vision, and it was not till 1894, barely twenty years ago, that any examination was made as to what I personally define as visual acuteness. From

1894 till the present time the examinations as regards eyesight have been conducted largely on principles laid down by a committee of the Royal Society, which was appointed in 1892, with Lord Raleigh as chairman. Shortly after the commission had issued its report I ventured, at a meeting of this society, to criticise it somewhat in detail, pointing out in particular that all color blind persons were not dangerous. That, however, is a totally different thing from saying that color blind people are safe.

The author defines vision composed of the color sense, visual acuteness the sense of form, the light sense over perspective. These functions are discussed in their relationship to navigation.

First of all, as regards the color sense. It must be at once admitted that if a man is unable from defect to distinguish clearly, immediately and without the slightest hesitation, the difference between the three lights used in navigation, namely, the masthead light, the starboard light and the port light, that he is unfit to be entrusted with navigational duties. If there is the slightest dubiety about the matter he ought not to be allowed to be in charge of a vessel. I would go the length of saying that he ought not to be employed even as a man on the look-out.

One form of what we may call acquired color blindness is specially dangerous. It is that form of it where the fibers connected with the macula lutea are involved, which condition gives rise to what is known as central color scotoma. One of the characteristics of this disease is that the person affected is no longer able to recognize colors just at the point of central fixation. If an object is presented to him of such dimensions that the image formed on his retina occupies only the macular area and does not extend beyond it, then the color most likely will not be seen. Red and green are the pigments which most often fail in color scotoma.

Now ships' sidelights at sea give at the distance of two miles, at which they are supposed to be visible, only very small images on the retina, and hence it is all but certain that a man with color scotoma will completely fail to distinguish these lights at the standard distance.

I am not inclined to accept the Young-Helmholtz theory as being anything more than tentative, and for me it is by no

means as yet proven. As I pointed out years ago, if Sir William Abney's interpretation of the Young-Helmholtz theory was correct, then all color blind people are perfectly safe, because the two portions of the spectrum from which the port and starboard lights are taken differ materially from each other, not only in normal vision, but in what he calls green-blind, red-blind and violet-blind vision. Now, as a matter of fact, there are many color blind people who are not safe, who are very dangerously color blind, and that is one reason why I hold that either the theory is not correct or Sir William Abney's interpretation is wrong.

The committee have not thought it necessary to take into consideration at all any theory of color blindness, and with that attitude I entirely agree. They have made an effort as regards color, to solve the following questions, namely: What are the best tests to be applied for the detection of defective color sensations? Secondly, What forms of color blindness are dangerous? Thirdly, What is the influence of fog on color perception?

The test used until now under authority of the Board of Trade has been very largely that of Holmgren, which when first introduced consisted of three test skeins, i. e., light green, pink and red. After 1899 yellow and purple test skeins were added. Relative to this test two questions naturally arise: Does the test by these wools ever exclude a man who is not color blind? On the other hand, do they ever let a man through who is color blind? Now there can be no doubt as to the answer to the first question: it is in the affirmative. A fair number of people have been rejected on account of a faulty selection of wools who have subsequently, on appeal, been passed in London by the more critical tests employed by Sir William Abney and his colleagues.

That shows conclusively that men are liable to be rejected on the wool test who have such good color sense as to be able to pass the much more stringent testing done with the spectroscope. That, to my mind, is proof positive that it is not altogether a very reliable test, and in the nature of things I personally do not see how it can be. There is nothing more difficult than the actual matching of colors.

So long as a man does not confuse anything of what is generally called the warm end of the spectrum with anything

at the cold end of it, then I think he is absolutely safe for purposes of navigation. To my mind, the insuperable difficulty with regard to the wool test is that it is not fair, for it does not eliminate the personal equation of the examiner and does not take into account the personal equation of the candidate.

On all hands it is admitted that the wool test depends upon the method in which it is applied; in other words, that a great deal depends upon the individuality of the examiner.

So long as a man is perfectly confident and perfectly clear in the separation of the two sides of the spectrum, that is, if he never by any chance confuses what is commonly called a warm color with a cold one, then I think almost certainly that man is safe for purposes of navigation.

In practice what is required is to distinguish the red, green and white lights as used in navigation and not to arrange skeins of colored wools. I personally am in favor of the wools being done away with altogether, for it is entirely an arbitrary test depending upon the wisdom, the tact, the patience or the ill-nature of the examiner at the time of the examination.

It is quite true that to some extent precautions are taken against injustice, for if a candidate fails pieces of the wools which he has confused are cut off the skeins and the pieces so removed are sent to London for the inspection of Sir William Abney or of his assistants. When we come to consider the recommendations of the committee as regards the color sense we shall find that they have retained the wool test, but indicate that in time it may be superseded altogether by a suitable lantern.

"We think, however, that the objection which we have quoted as to the difficulty experienced by candidates owing to their unfamiliarity with the procedure and to the great variety of choice offered would be met by dividing the whole collection of skeins into as many groups as there are test skeins; each such group should be composed of a fixed number of skeins which resemble in color the test skein and a fixed number of skeins which experience has shown to be those which color blind persons are most likely to confuse with the test skein. Candidates should be required to divide each group of skeins into two parts—those which resemble in

color the test skein and those which do not." I regard that as altogether excellent provided the candidate is not informed as to how many skeins there are like the test skein and how many of different colors. Of course if he knew that it would help him very materially.

Before closing this section I may say that there is not a practical navigator examined before the committee who does not prefer the lantern test to the wool one. The committee have retained the wool test, but I think in such a way as to indicate that they do so with some hesitation.

As regards lamp tests, that is the practical test and the one which I personally approve of. As long as a man can infallibly, clearly and immediately distinguish between the white light, the green light and the red light used for purposes of navigation then I at once say he is safe.

A lamp test with certain restrictions is a thoroughly good one and is most like what the candidate will have to do in everyday practice. Indeed the Board of Trade now insist that lanterns shall be used, and on page 15 of the report they give details of the kind of lantern they think desirable.

It is these very mixtures of rays of light coming through pieces of glass that the candidate has to examine at sea. Why should he have to examine anything else on shore? As a test it is not merely illogical but it is unfair to put lanterns out of account on the ground that they are not monochromatic and to prefer test skeins. These skeins are not any more monochromatic than are the lantern glasses; they equally are mixtures of different colors. There is scarcely anything rarer in nature than a pure color.

Practically the whole of the nautical witnesses without exception favor the lantern test and object in the main, some of them very strongly, to the wool test.

I think perhaps that there is room for a more thorough standardization of the colors of the sidelights of ships and of their luminosities. The red light seems to me tolerably good; a ruby glass with a lamp behind it which will show for at least two miles. The trouble is for the most part with the green light. It is sometimes too pale, at other times it is not luminous enough.

I personally favor a light that is perhaps a little more luminous and has not the same tendency at great dis-

stances to appear as white. That there are very great differences in green lights as used at sea just now is brought out by the evidence of Captain Henry Russell, who has made numerous observations, and finds that there is a great difference in the greens, and he quotes the Liverpool dockmaster as saying that you seldom see two ships showing the same green light.

It is a matter of common knowledge that by producing absorption a dense fog will cause the sun in the heavens, if it can be seen at all, to appear as of a blood red. It is therefore only fair to suppose that a fog may give a red tinge to the masthead light.

I can quite believe that fog may alter the ordinary green light into a sickly yellowish green or yellowish white.

Red rays are abundant in the sun, and at a certain density fog seems to have the power of absorbing all the others and only transmitting those of a certain frequency. If we take the green glass of a ship's light the red rays are practically negligible, and consequently when the fog causes absorption of the green they are not there to be transmitted.

I think a fundamental error has been committed primarily by ophthalmic surgeons who have written on the subject, and secondarily by the committee who have followed them in proposing to test what they call the form sense by means of letters. When you employ letters to investigate vision, for the most part you are not testing the form sense, but are testing the visual acuteness, and I hope that in time the difference between these two functions will be admitted on all hands. Let me illustrate what I mean. Two examples will give us at any rate some idea of the difference. I take a page of print and I look at one particular word at the center of the page, keeping my eye steadily fixed on that. When I do so I find that I cannot make out any letters whatsoever in its immediate neighborhood. I have for the area occupied by the word at which I am at the moment looking visual acuteness. For the rest of the page there is form sense but no visual acuteness. What I have elsewhere termed the field of visual acuteness occupies only a space corresponding to an angular projection of only a few degrees round the point of fixation. That illustrates precisely what is meant by visual acuteness. Now the form sense can easily be illustrated in

the same way. I again keep my eye fixed on the original word at the center of the page, and while doing so I am perfectly conscious all the while of the various forms of the objects in the room. I can perfectly see the general shape of the ladies and gentlemen sitting on the benches. If I were in movement I could see them sufficiently well to be able to avoid them. Here I may remark parenthetically that the Board of Trade have practically taken up the position that unless a man has visual acuteness and can see to recognize an individual that then he is likely to collide with that individual. Now it humbly seems to me that although a man may not use his visual acuteness so as to recognize a person yet he uses his form sense, and by doing so runs no risk of collision.

They have practically said that unless a man has visual acuteness of a certain standard that he is unfit to navigate.

I do not suppose anybody even with the best sight picks up objects at sea by visual acuteness. It is almost entirely done by this form sense. It is all nonsense to say that because a man cannot read letters at a certain distance that he cannot see a steamer directly she appears on the horizon. A myopic person may not, but a person with a considerable degree of hypermetropia undoubtedly will. This power, as I have already indicated, depends probably upon the differences of colors or the differences of shades, and possibly the best way of putting it is simply to say that it depends upon a difference of background.

Visual acuteness has to do with the seeing of letters, form sense has to do with the seeing of objects generally in the field of vision. So long as a man can do that I feel that he is tolerably safe for navigation, although I admit that the object requires further elucidation.

Almost all persons who suffer purely from refractive error and not from any disease of the eyes can as a rule be brought up to normal by suitable spectacles. The question then has arisen, if that be so, shall we allow persons who are defective on account of errors of refraction to wear spectacles on the bridge? I am emphatically of opinion that we cannot. The constant gathering of moisture on glasses, the blurring which would be produced by steam, by spray, by rain, by snow, makes a man who has to depend entirely on glasses very inefficient. Further, as I shall indicate later, spectacles affect

most disastrously the light sense and would be quite unsuitable for night navigation.

I have said that persons with myopia are not suitable for bridge work, although persons with a slight amount of hypermetropia are. In early life a distinctly hypermetropic person may have excellent vision because of his accommodation, but later, as he gets older, the accommodation fails and the vision may become very bad. I would say that a man who has more hypermetropia than two and one-half diopters may have considerable difficulty when his accommodation fails. If that be so, I would like to go back on part of the evidence which I read before the committee, namely, I said that I would be content were the examinations left in the hands of a physiologist or of a physicist, and I indicated that I did not think it necessary to have candidates examined by an ophthalmic surgeon.

But what astonishes me most in the whole thing is that the committee have absolutely made no regulations as to the testing of the light sense, yet that, to my mind, is one of the most important functions of vision connected with navigation. Icebergs do not carry lights, low-lying ground does not necessarily carry lights, nor does a waterlogged derelict, and these are things which are specially dangerous in navigation. The committee seem to have gone on the assumption that all men with normal visual acuteness are equally good at seeing such objects, as I have just enumerated. They do not mention the light sense at all, and evidently do not think it of importance. I must say it seems to me of extreme importance. Take a dark night and an iceberg in the way. A man with a good light sense or what is technically known as a good light difference sense, may see that obstacle when a man with a bad one will not.

And I, for one, considering the dangers of night navigation, as indicated above, would have the greatest possible hesitation in putting any man on the bridge who has not got a good light sense.

N. M. B.

Detachment of the Retina Produced by General Edema.

SYM, W. G. (*Ophthal. Rec.*, October, 1913), reports a case of double detachment of the retina produced rapidly from the edema of a complicated pregnancy which cleared up rapidly following delivery.

N. M. B.

Anterior Ring of Opacity in the Lens Following a Contusion.

COATS, GEO. (*Ophth. Rec.*, October, 1913), reports the condition following a blow received upon the right eye from a large piece of clay. The article contains the various theories advanced as to the cause of the condition and a number of references.

N. M. B.

Bacteriologic Testing of the Conjunctiva.

FERGUS, F. (*Ophth. Rec.*, October, 1913). So soon as the patient is admitted to the clinic, agar tubes or serum tubes, or both, are inoculated with conjunctival secretion, then from the commencement of the residence the conjunctiva is thoroughly irrigated several times a day with normal saline and the skin of the face in the neighborhood is from time to time thoroughly cleansed with soft soap and hot water and spirit. Unfortunately no chemical can be used to the conjunctiva which is of any avail. No drug can be employed in sufficiently strong solution to kill germs without at the same time destroying the conjunctiva and cornea; therefore, for the preparation of the conjunctiva, irrigation with sterilized normal saline is the only method available. This is followed by a detailed description of the operative procedures.

N. M. B.

Double Congenital Coloboma of the Lids With Symblepharon.

HAY, P. J. (*Ophth. Rec.*, October, 1913), describes in detail a case of double congenital coloboma of the lids with symblepharon in a well developed girl of four years of age.

N. M. B.

Tarsitis Necrotican.

JARMATOWSKI (*Ophth. Rec.*, September, 1913) reports a case of what appears to belong to a rare group of cases, of which four have already been described by Mitvalsky, and is really due to an infection with staphylococcus aureus of so acute a nature as to cause necrosis of the Meibomian glands and investing tarsus with practically no antecedent inflammation.

N. M. B.

An Optical Method of Rectifying Cataract Lenses.

MADDOX, E. E. (*Ophth. Rec.*, September, 1913). Wearers of strong lenses who are not careful to adjust their glasses are liable to experience ocular fatigue from the artificial

hyperphoria which is created by unequal vertical displacements of their two lenses. It may be that one eye stands higher in the face than the other; or that from asymmetry of the nose, or imperfect adaptation of the frame, or more commonly still from simple carelessness, the line between the optical centers of the glasses is not parallel, as it should be, with the base line of the eyes.

This I feel convinced is often due to the artificial hyperphoria, which the patient has never experienced before, and for which the cerebral centers are untrained and unprepared. It is desirable, therefore, to supply such patients with a means of training themselves to keep their glasses rightly set. All that is necessary is a rectangular piece of paper or card, or better still, a sheet of celluloid, that can be carried in the pocket, about three inches long and equal to, or not more than one millimeter narrower than the distance between the patient's two parallel visual lines. Its possessor should hold it a few inches in front of his face, so that the eyes can just look past its two edges at the picture rail or cornice line of the ceiling, or any other bold horizontal line that presents itself in the room. The sheet now rather more than fills the interval between the gently converging visual lines, so that the eyes are dissociated, and any artificial hyperphoria at once manifests itself by one side of the line rising higher than the other.

The slightest touch to the spectacles at once makes the two halves of the line respond by rising or falling, and the frame can be adjusted accordingly till the line appears continuous. Whenever the eyes feel tired or strained, the test should be repeated to ascertain if the cause be of this nature. For those who need both hands to adjust their frames, a short stick can be attached to the screen, and be held between the teeth like a pipe. A few such experiments may so train the patient how to carry his frame as to need the tests no longer. In the absence of a screen it is quite possible with a little more skill to carry out the test by the hand alone, held with just the degree of obliquity required to slightly more than fill the space between the visual lines.

For presbyopia, a horizontal line at reading distance should be employed, such, for example, as the upper edge of a periodical or sheet of paper.

The simple rule can be given, though not necessary, that convex lenses should be adjusted "with," and concave lenses "against," the apparent displacement of the line; thus if the right half of the line appear highest the right lens must be raised if convex, or lowered if concave. N. M. B.

Sclerostomy.—An Operation for Glaucoma. A Preliminary Note on Its Technic.

POOLEY, G. H. (*Ophth. Rec.*, July, 1913). In attempting to find an operation for glaucoma which would give satisfactory results and yet be free from—

- (1) Danger and difficulty during operation.
- (2) Unpleasant sequelæ.

The experience I had then had was with

- (1) The classical peripheral iridectomy.
- (2) Herbert's operation.
- (3) Lagrange's operation.

The first operation certainly gave very good results in many cases; in some, with the formation of an obvious stoma between the anterior chamber and the conjunctival sac, in others, especially the more acute cases, without any obvious stoma. The disadvantages were:

(1) The large coloboma admitted too much light into the eye and the patients often complained of dazzling.

(2) There was usually some loss of the already diminished visual field.

(3) If the patient squeezed during the operation the lens might be severely injured or expelled from the eye with possible loss of vitreous.

(4) Usually at least one or more diopters of astigmatism were caused by it.

The second operation was a very safe one and gave very little astigmatism, but were the results permanent? The third operation gave brilliant results in some cases, but—

(1) There was danger of injury to the lens if the patient squeezed.

(2) There was often three, four or more diopters of astigmatism as a result of the operation.

Now, how can injury to the lens be best avoided?

(1) By the use of instruments, the cutting edges and points of which are as little as possible free in the anterior chamber.

and by cutting outwards rather than inwards. In fact, by using a straight knife and by cutting a flap by transfixion. For this a small but stiff knife was needed.

(2) The incision must be small so that the lens cannot escape or present in the wound and damage its capsule. I find no difficulty in making an incision about 4 mm. in length with the knife I have just described, and this length of incision does not, in my experience, gape enough to allow the lens to present.

Now, how can an efficient stoma be made without causing much astigmatism? The astigmatism is probably due to overriding of the margins of the wound, so that if a wound is small, does not gape and its edges are squarely cut, one is not likely to get much astigmatism. The stoma should connect the anterior chamber with the subconjunctival areolar tissue and be placed as far forward as possible so as to avoid—

(1) Blocking by the base of the iris or the ciliary body.

(2) The necessity for a large iridectomy, while obtaining the protection of a conjunctival flap against infection of the interior of the eyeball through the stoma.

By making the puncture and counter puncture about 1 mm. outside the attachment of the conjunctiva to the cornea, and by cutting squarely outwards as near to the corneal attachment of the conjunctiva as possible, a section of the cornea with a conjunctival flap can be obtained, and owing to the leaking of the aqueous into the subconjunctival tissues, often with only a linear wound of the conjunctiva. The tissue should be removed as far as possible in the vertical rather than in the horizontal meridian; this can be accomplished by seizing the posterior lip of the wound with a pair of forceps, and excising a piece about $1\frac{1}{2}$ mm. in diameter and roughly square in shape..

A special knife, forceps and scissors are described.

Method of treatment of patient, selection of cases, time for operation.—Cases of glaucoma may be classified as—

Uncomplicated—acute, subacute and chronic.

Complicated cases:

(1) Originally uncomplicated, but of long standing, with atrophy of iris and secondary inflammation.

(2) Cases secondary to trauma, with injuries to lens, etc.

(3) Cases due to swelling of unripe cataract.

- (4) Cases with retinal hemorrhages.
- (5) Cases secondary to iritis.
- (6) Cases secondary to iridocyclitis.
- (7) Cases secondary to cataract extraction.

All cases should be sent to bed at once in a nursing home or hospital for choice, purged freely, blood pressure reduced to normal, hot bathings used every hour to the affected eye or eyes.

For uncomplicated and complicated cases 1, 3, 4 and 7 use pilocarpin or eserine; for cases 2, 5 and 6 use atropin. As soon as the blood pressure is normal and the eye as quiet and soft as it is likely to become, operate.

Method of performing the operation.—The skin round the eye is cleaned before operation and cocaine 10 per cent instilled several times for half an hour before operation. When the patient is on the table, a speculum, Lang's or Lawford's, is introduced and the conjunctival sac irrigated with sterile water. The knife is then entered as before mentioned and the 4 mm. section made. If the conjunctiva is bulged by aqueous escaping, only a linear cut is made in the conjunctiva; this can be extended by cutting the conjunctiva parallel to the corneal margin, but at some distance from it, forming an L-shaped flap which is turned aside. The special forceps are inserted into the anterior chamber through the wound and the posterior lip of the wound gripped, and the portion gripped excised, making the wound as narrow laterally, and as deep anteroposteriorly as possible, without going back as far as the root of the iris. If the iris does not prolapse it can be seized near its base, brought into the wound and the smallest possible buttonhole made; if it prolapses into the wound, two snips of the de Wecker scissors suffice to make a small buttonhole. In complicated cases a larger iridectomy can be made if desired. The flap is then replaced and the eye bandaged after atropin has been instilled.

Complications at time of operation—

- (1) Damage to conjunctival flap; if slight, replace it; if severe, cut away flap and bring down fresh conjunctiva by a stitch or two after undercutting it at the corneal margin for some distance on each side of the wound.
- (2) Prolapse of iris caught in forceps, excise prolapsed portion.

(3) Injury to lens. I only remember one case, which occurred over two years ago; a patient squeezed very hard on a pair of iris forceps with downturned points and damaged his lens, which became opaque.

(4) Loss of vitreous: a rare occurrence, but will sometimes happen in cases of long duration in which the tension cannot be reduced before operation; by suturing the wound a fair result can often be obtained.

(5) Infection of wound. Septic infection practically never occurs, but very rarely a late iridocyclitis may follow, especially after exposure to cold winds. I have had two cases in a stage of late convalescence; one had been sent home too soon by a house surgeon, the other came on months after the operation after exposure to a very strong cold wind. Both these cases occurred amongst my earlier cases, before I had perfected the details of the technic.

Comparison with other operative measures.—The operation which most closely resembles this is the operation of trephining the anterior chamber. The operation I have just described has these points of contrast:

(1) The instruments are easily kept sharp and require no special practice to use, the knives are not expensive. It can be performed without special instruments in an emergency. The operator has great control over his instruments and the eyeball.

(2) The cutting is from inside outwards; which diminishes the risk of accident, except when making the puncture and crossing the anterior chamber, a maneuver every ophthalmic surgeon is accustomed to.

(3) The wound is far forward in the anterior chamber. In some of my early cases I made the corneal section and then withdrew my knife and turned down a large conjunctival flap with scissors. I was surprised at the distance I had to cut into what seemed to be corneal tissue before I reached my incision. This shows that the internal aspect of the wound is far forward in the cornea—the resulting stoma appears to be astride the corneal margin—the whole thickness of cornea is evenly excised and the internal wound is quite as large as the external.

Results.—Although time and space prevent my giving a detailed list of my results now, I hope to have them ready

for the International Congress this summer; I trust then to show what I now believe that they are:

(1) As to vision. This is usually most satisfactory, there is generally a steady improvement for a long time afterwards.

(2) As to the visual field. This is usually no less, in some cases it is apparently larger.

(3) As to astigmatism. Usually from 0.5 to 1 diopter, sometimes less than 0.5.

(4) As to glare. Annoyance from this is usually absent.

(5) As to tension. This usually remains normal or less than +1.

(6) As to filtration. This is usually free, and remains so, the conjunctiva pitting on pressure; even in one case where the stoma is partly blocked by uveal tissue, there is still pitting, more than two years after the operation.

(7) Iritic adhesions are usually absent. N. M. B.

The Influence of Chronic Sepsis Upon Eye Disease.

LANG, WM. (*Lancet*, May 17, 1913), has taught for the last ten years that a chronic source of sepsis could cause an inflammation in any part of the eye.

"My attention was first drawn to the subject of oral sepsis as a factor in the causation of eye diseases by an original observation made by my friend and colleague, Mr. William Hern, who told me he had found pyorrhea in every case of acne rosacea, and noticed that the eruption improved or disappeared after the mouth was treated. At that time a patient with acne rosacea was under my care for attacks of keratitis, which had recurred at intervals in spite of local and general medication, but after treating the pyorrhea the keratitis ceased to return.

"From this time onwards I examined the gums in all the cases of inflammatory affections where the ordinarily accepted causes of the disease were absent, and thus gradually I came to recognize that pyorrhea caused inflammation in every part of the eye.

"After a time in cases where all the other recognized causes were absent and the mouth was clean I began to look elsewhere for the source of sepsis. In this way I gradually extended my searches until I recognized that the source of

sepsis might be in any of the mucous membranes, in a chronic sore on the skin, or in a sinus opening on the skin or on a mucous surface.

"Although in common with other observers I failed, after much investigation, to discover the nature of the poison, nevertheless, after watching the effects produced by removing the suspected source of sepsis I was convinced that the diagnosis was correct; for as soon as the source of sepsis is removed the inflammation begins to subside, the rheumatic pains in various parts cease, a feeling of well-being takes place, and in recent cases of central choroiditis the lost vision quickly returns.

"In hospital practice, where clean mouths are the exception, one sees every day many cases of inflammation of the eye due to oral sepsis. In order to find out what proportion of the cases of inflammation of the eyeball occurring in private practice were due to sepsis I have had a table made from the notes of my last 10,000 patients. In it is included every case of inflammation, with the exception of those limited to the conjunctiva, where a cause for the disease had been found. The results shown in these tables were unexpected, especially as the cases due to sepsis must have been underestimated in the earlier years, because no search was made in many of the parts of the body which now would be investigated. For example, in the absence of bladder symptoms the urine, when it appeared to be normal to the eye and to the smell, was not examined for microorganisms, though it might have contained many thousands to the cubic centimeter and have been the cause of the eye affection. Owing to this increase of knowledge the number of cases in which the source remained undiscovered has decreased until it is now half what it was at first, and forms one-half per cent of last year's patients.

Table I.—The Source and Number of the Cases (215) Attributed to Sepsis.

Lacrimal sac.....	1	Large gut infection, in-	
Antrum of Highmore	1	cluding colitis and the	
Nasal inflammation.....	2	like	33
Inflamed tonsils.....	3	Kidney and bladder.....	4
Pyorrhea	139	Male urethra	20
"Indigestion"	2	Uterus and appendages	3
Appendicitis	3	Skin diseases.....	4

Table Ia.—The Number of Times that the Different Parts of the Eye were Infected in the 215 Septic Cases of Table I.

Sclerotic	20	Retina	28
Cornea	12	Detached retina.....	3
Iris	87	Optic neuritis or atrophy..	4
Ciliary body.....	79	Lens (secondary cataract)	14
Choroid	68		

Table II.—The Causes to which the Other Cases (168) were Attributed and their Numbers.

Syphilis, congenital.....	40	Gout	23
Syphilis, acquired.....	35	Diabetes	12
Tubercle	27	Following acute fevers.....	7
Albuminuria	24		

Table IIa.—The Frequency with which the Different Parts of the Eye were Affected by the Diseases in Table II.

Sclerotic	24	Choroid	35
Cornea	47	Retina	36
Iris	25	Optic neuritis or atrophy....	12
Ciliary body.....	4	Lens (secondary cataract)	1

"In comparing the number of cases in Tables I and II the importance of sepsis in the causation of eye diseases is obvious, since 215 are attributed to it alone and only 168 to all the other recognized causes.

"Of the 215 toxic cases 180, if the 3 tonsil cases are included, are due to alimentary toxemia, and 139 are credited to pyorrhea alone; hence the importance of oral hygiene. Cases due to gonococcus have been included in this table, because when these patients come to the ophthalmic surgeon they are suffering from iritis and cyclitis, due generally to an infection of the prostate, the remains of an uncured urethritis, which must be dealt with by massage and vaccines if a permanent cure is to be effected.

"The remaining causes are very important, although they form such a small minority, since they indicate the sources that must be investigated if an obscure case is to be elucidated.

"Tables Ia and IIa will be of interest chiefly to the ophthalmic surgeon. They record the number of different parts affected; in many patients the disease attacked more than one part. In the septic group, Table Ia, it will be noticed that the

uveal tract is the part chiefly involved, hence the greater number of secondary cataracts; whereas in Table IIa the sclerotic and cornea, the retina and optic nerve are more frequently affected.

"Though it would appear to be obvious after seeing these tables that sepsis from pyorrhea is an important agent in causing inflammation of the eye, nevertheless the general application of this view is not yet universally accepted. It seems incomprehensible that a surgeon, whose single aim is to avoid sepsis in his operations, can think it a matter of no importance that a person should have a chronic source of sepsis in any part of his body.

"I wish to draw especial attention to the baneful influence, that a chronic septic focus frequently exerts upon eyes that have been operated upon. The eye often becomes acutely inflamed, and remains red for a much longer period than the severity of the operation would warrant, but rapidly quiets down when the exciting cause has been removed. Although no permanent harm usually results, such a complication to the operation as this is to be avoided if possible, and therefore before I operate on any patient I always have the mouth examined and put in order if necessary, and have a search made for other septic foci should there be any indication for so doing."

N. M. B.

Two Cases of Permanent Hemianopia Following Severe Attacks of Migraine.

ORMOND, A. W. (*Ophth. Rec.*, July, 1913), reports in detail two cases of permanent hemianopia following severe migraine. Other similar cases reported in the literature are referred to. The author can find no more probable hypothesis to explain them than that during the attack of migraine a spasm of that branch of the posterior cerebral artery supplying the visual center took place, resulting in a permanent interference with the visual function of that side, and so leading to blindness on the opposite side.

N. M. B.

On Albuminuric Retinitis Occurring in Cases of Small White Kidney.

JAMES, R. R. (*Ophth. Rec.*, June, 1913). The following conclusions are given as a result of the study of twenty-four cases of small white kidney. The cases are arranged in tabu-

lative form with additional notes in certain instances. There is also a short description of the macroscopic and microscopic findings in those cases subjected to postmortem examination.

In his opinion the following conclusions are justified: "That small white kidney is a disease of young adults, and that when they are seen first for symptoms complained of they have obviously had chronic nephritis for some considerable time without any symptoms at all, and that they come up first of all as a rule in a terminal phase.

"Among the initial symptoms complained of, severe headache is very constant, vomiting is fairly frequently met with, epistaxis and defective sight occasionally.

"Seldom is there any edema of the face or extremities in a true small white kidney, and if edema is present we must assume the presence of a subacute tubal nephritis as an additional factor.

"The urine is of low specific gravity, may be increased, or diminished or normal in amount, the amount of albumin present is variable, but there is usually a good deal, and the amount seems to vary from time to time, the quantity of urine seems to be increased, as a rule, if the patient is taking ordinary food and the usual amount of fluids.

"As regards the cardiovascular system, the vessels are nearly always thickened, but they are not so thick, tortuous and diseased as in the small red granular kidney. The blood pressure is always very high, even if the wall be not excessively thickened, and most of the cases with blood pressure exceeding 180 mm. show neuroretinitis.

"The heart, as a rule, shows a pure left ventricle hypertrophy without appreciable dilatation, save of course in cases complicated by the presence of old rheumatic valvular disease: i. e., the apex beat is very little displaced, but it is distinctly forcible. The aortic second sound at the base is always loud and ringing.

"Secondary cardiac failure is rare, because probably the patients die of toxemia before the heart fails.

"Cerebral hemorrhage is rare for the same reason, and also the patients are young, and the vessel wall is not markedly diseased apart from hypertrophy. This series contains two cases, and one possible other case, where this accident so commonly met with in red granular kidney cases, occurred.

"As to uremia, in all probability true uremia is not common, but nearly all these patients have severe headache, and many of them vomiting; if readers consider these as uremic, then every case will have uremia. Some undoubtedly get drowsy and have a true uremia, but the terminal condition generally is one of profound toxemia with secondary anemia, which is very marked in late cases and which is quite unlike ordinary uremia, but which is associated with drowsy semi-delirious coma.

As Regards the Fundus Oculi.—Four of this series were discovered first of all in the eye department and many of them complain of loss of sight if questioned.

The changes (see picture) are those of a very marked neuroretinitis, with moderate swelling of the disc and surrounding retina; exudate seems to be in excess of hemorrhage, and the macula star is usually well marked, while the vessels are small and thick.

The frequency of retinitis is far higher in small white kidneys than in large white, and in my opinion is quite as high, if not higher, than in small red granular kidney.

Vitreous hemorrhage and subconjunctival hemorrhage were noted in two cases.

Comparing the picture with that seen in advanced red granular kidney, the eye changes are far more severe in small white kidney. In red granular kidney the vision is rarely so markedly diminished, often there is nothing to lead one to examine the eyes till one finds that the case is one of red granular kidney; small white kidneys on the other hand often come up for their sight first of all.

The prognosis is grave, far graver than in the red granular kidney. These cases often get rapidly worse, and die in a few weeks. A few temporarily improve, but apparently do not live longer than a few months or rarely more than a year.

As regards etiology, scarlet fever and syphilis should be inquired into, but this series of cases does not suggest that they are causative factors.

Treatment.—The only treatment consists in measures to reduce the high blood pressure, purgation, hot air baths, diet, and possibly iodids by the mouth.

As Regards Morbid Anatomy.—The kidneys as a rule, but not always, are small, there is some diminution of cortex,

the surface is slightly irregular, and there is no great tendency for the capsule to adhere to the cortex, as there is in advanced red granular kidney, and the capsule strips fairly easily without tearing.

Microscopically there is a diffuse active fibrosis coupled with diffuse tubal change, the characteristic being the proliferation of the epithelium of Bowman's capsule, which seems to proceed on the inner aspects of it, rather than on the outer, as is the case in red granular kidney, and like the other changes in small white kidney is more of an active inflammatory process than in red granular kidney.

The changes are also far more marked in small white kidneys, and the changes are uniform in all glomeruli, whereas in small red granular kidney some glomeruli show little change while others are mere balls of fibrous tissue.

From the postmortem notes it would appear possible that some cases of small white kidney have undoubtedly arisen from the large white variety, and the fact that Case 13 is still alive and really in better health than she was four years ago makes me rather doubtful as to whether she really is a true case of small white kidney: the whole subject is an exceedingly difficult one in which to arrive at positive conclusions, and statistics are notoriously fallacious. Many of the cases in the series do show, however, a good many points in common.

N. M. B.

The Surgical Treatment of High Myopia.

LAMBERT, WALTER EYRE (*Ophthalmology*, July, 1913), reports fourteen operations in seven patients, with good visual results in all. It is generally agreed that the operation does not prevent the axial lengthening of the ball, nor the other complications of high myopia, but the improvement in vision, and the fact that it is obtained with a so much weaker lens, justifies the operation. In spite of the opinion of others to the contrary, the writer thinks operating on both eyes is an advantage.

E. C. E.

Subconjunctival Injections of Cyanid of Mercury in Ophthalmology.

MEDINGS, C. B. (*Ophthalmology*, Vol. IX, No. 4), has had considerable experience with subconjunctival injection at the Amritsar Hospital, India, in a great variety of conditions. It

is not easy to explain how or why the injections are so helpful, unless it is due to their lymphogogue, alterative, eliminant and antiseptic action. The injection consists of 10 to 20 minims of 1/4000 cyanid of mercury solution. The cases comprised:

Condition.	Number Injected.	Good Results.	No Results.
Opacities of vitreous.....	1	1	...
Trachomatous keratitis (pannus).....	100	75	3
Ulcers, acute-indolent	40	25	5
Ulcer hypopyon	3	2	...
Keratitis ulcerus suppurativa	2	1	...
Corneal opacities (recent).....	28	10	...
Keratitis parenchymatous	3	1	...
Sympathetic ophthalmia	1	1	...
Episcleritis and scleritis.....	4	2	1

There were a total of 182 cases, 118 of which were noted as being followed by good results. The author has not observed the "frightful" reaction of which some speak, and on the whole treats the question of reaction and pain very lightly. The adhesions said to occur between the conjunctiva and sclera, are said by the writer to be temporary, "and this was certainly true in those where examination was made ten months or a year after injections previous to operations." The author also insists on the early use of the injection in infected cases, and says that warm solutions are less painful. He is especially impressed with the value of the treatment in old trachoma and pannus with blinding lacrimation and pannus.

[It may be recalled that Col. Elliot of Madras published his results in granular ophthalmia with this remedy two years ago (*Indian Medical Gazette*, September, 1911). His conclusions were that it exerted no favorable influence on the granulations or pannus, and caused intense reaction, pain and paresis of the levator muscle.]

E. C. E.

Management of Hyperesophoria and Hyperexophoria.

GIBBONS, EDWARD E. (*Ophthalmology*, Vol. IX, No. 4), gives the following rule for determining the position of the base of the "resultant" prism, intended to correct hyperesophoria and hyperexophoria:

"Add the amount of the hyperphoria and lateral error together ($2 + 4 = 6$). Divide the result into 90° ($90 \div 6 = 15^\circ$); that is, a 6° prism must be rotated 15° to equal in effect a prism of 1° , and if there are 2° of hyperphoria to be corrected the 6° prism must be rotated 30° . The strength of prism needed is to be divided between the two eyes so that a 3° prism is placed before each eye with its base-apex line at 30° ." He prefers to test the muscles with the Maddox double prism, as both the errors are measured at the same time, and the influence of each on the other is manifest. E. C. E.

Central Scotoma and Blind Spot Anomalies—Their Clinical Significance.

FRIDENBERG, PERCY (*Ophthalmology*, Vol. IX, No. 4), discusses central scotoma, ring scotoma and enlargement of the blind spot. While central scotoma is a well known sign of retrobulbar neuritis, which in turn is usually toxic, in another group of cases we have to deal with accessory sinus disease as a factor, especially the posterior ethmoid and sphenoidal sinuses. This is due to the proximity of the nerve to these sinuses, though the exact method of its involvement is not so clear, and probably it is not the same way in all cases. In tumors and abscesses pressing directly on the nerve, central scotoma and primary optic atrophy have been observed by Foster Kennedy on the side of the lesion, with papilledema of the opposite side. Other conditions giving rise to central scotoma are tabes, alcoholic neuritis, multiple sclerosis, acute myelitis, acute anemia, and cranial trauma. In tabes a central scotoma is significant of retrobulbar neuritis, and not of primary atrophy.

Ring scotoma may be due to multiple sclerosis. Other causes are hysteria and sinus disease.

Enlargement of the blind spot may be due to any intracocular changes which destroy the function of the retina immediately about the nerve head, as, for example, the mechanical pressure in choked disc. Aside from ophthalmoscopically evident causes, enlargement of the blind spot implies loss of function in the peripapillary bundle of optic nerve fibers, which are situated immediately internal to the optic nerve sheath, i. e., most peripherally. Enlargement of the blind spot has been observed as an invariable accompaniment of disease of

the posterior accessory nasal sinuses, and may be considered almost pathognomonic. Many cases have been recorded to bear out this connection. Asthenopic symptoms with the visual aura of migraine (scintillating scotoma) have also been observed. The difficulty of detecting enlargement of the blind spot is mentioned, and the author has constructed a perimeter scale to make it more feasible. E. C. E.

Further Experience With My Sclerotomy Cruciate Multiplex (Grill-Like Sclerotomy).

WICHERKIEWICZ, M. (*Ophthalmology*, Vol. IX, No. 4). This method of operation was intended for those forms of glaucoma in which iridectomy and anterior sclerotomy fail, viz., glaucoma simplex, and those in which operation had no lasting results, and for certain forms of inflammatory glaucoma in which the inflammatory symptoms were favorably influenced by iridectomy, but in which the vision deteriorated, and easily for secondary glaucoma, in which the anterior out-lets cannot be approached.

Frequently the sclera, especially of older people, feels very rigid to the touch, and examination of enucleated eyes confirms this by the increased thickness of the sclera. If this be the case, multiple recticular incisions of the rigid sclera to its deepest layers must make it more expansible, lower the pressure exerted by it and prevent a stasis of lymph in the suprachoroidal space.

It must, however, be emphasized that intraocular tension and rigidity of the sclera do not always coincide, but may frequently show an opposite behavior. The rigidity of the sclera may appear very intense and the tonometer placed upon the cornea may register no increase of tension, because in this method the sclera is not included. If intraocular tension is increased and the rigidity of the sclera diminished, the increase of tension will be indicated by the tonometer, but not by the palpating finger. Cases also occur in which the cornea by pathologic changes has become rigid for palpation, whereas the sclera is atrophic and soft. Here the globe appears less tense to the finger than the other scarcely altered eye, and still the tonometer always recorded the same result, viz., a higher pressure of the blind, apparently softer, eye than of the other. Hence it follows that the tonometer is not always a reliable gauge as to the success of an antiglaucomatous oper-

ation in rigidity of the sclera. Therefore, not only the tonometer ought to be applied, but also the rigidity of the cornea and sclera tested with the finger for the correct estimation of the pathologic relations. Thus we may in those cases in which there is no decided increase of tension, and still failure of central and peripheral vision with excavation of the disc, recognize the rigidity of the sclera as the only cause of it. Here chiefly this operative method proves very useful, perhaps unique, in preventing the further deterioration of vision.

Operation.—After instillation of cocain a subconjunctival injection of a 1 per cent solution of cocain with adrenalin is made into the upper temporal region of the eyeball. While an assistant rotates the eyeball far downwards with a sharp hook inserted above the cornea I make a long meridional incision through the conjunctiva. The subconjunctival tissue is lifted up with two pairs of forceps and incised successively to the sclera, the bleeding being controlled by instillations of adrenalin. After the sclera is largely exposed I make with von Graefe's knife from four to six meridional sections, as far back as possible. If the sclera is very thick some of the incisions are deepened, but only from 2 to 3 mm. long, as far as to the choroid. After irrigations with salt or boric acid solutions and finally electragol, the wound of the conjunctiva and Tenon's capsule is closed with a few firm sutures and a bandage applied for from one to two days. The patient is not confined to bed. After from four to five days the sutures are removed. Generally the intraocular tension is considerably diminished immediately after the operation, but more so if the eye is massaged, which always ought to be done before applying the dressing.

The operation was performed in glaucoma, with iritis and iridocyclitis, if punctures did not help and iridectomy was contraindicated for some reason or other, then in glaucoma in preliminary operation for cataract, hemorrhagic glaucoma, which generally takes a malignant course after iridectomy. Keratoconus and keratoglobus in some cases were benefited by the operation by improvement of vision and decrease of myopia and irregular astigmatism. Also the glaucomatous symptoms produced by dislocation of the lens into the vitreous, in rigidity of the sclera, were favorably influenced by this sclerotomy. The writer does not consider his operation as a panacea for any form of glaucoma. Like all others, it

surely may frequently fail, but before all it may be claimed for it, in the author's opinion, that it is perhaps the only rational method against glaucoma simplex. E. C. E.

Two Cases of Lacrimal Cysts.

FERNANDEZ, JUAN SANTOS (*Ophthalmology*, July, 1913), describes in a very unsatisfactory manner two cases in which small suppurating cysts communicated with the lacrimal duct, and were cured by dilating the punctæ, and evacuating the contents of the cysts through the lacrimal passages. The obscure description of the cases is rendered more so by bad proof reading. E. C. E.

Absorption of the Lens Nucleus in a Patient Aged Sixty-six Years.

DUDLEY, WILLIAM H. (*Ophthalmology*, July, 1913). This case is reported as a curiosity, in that the lens of the patient, sixty-six years old, completely dissolved after rupture of the capsule. Presumably no foreign body entered the eye, but the rupture was produced by concussion. E. C. E.

The Physiology of the Hypophysis Cerebri.

SIMPSON, SOUTHERLAND (*Ophthalmology*, July, 1913). This article is a review of the literature, and the deductions it draws as to the effect of the intravenous injection of extracts of the posterior lobe are that it produces four distinct effects: vasoconstriction in the systemic circulation, except the kidney, where there is a vasodilatation; under certain conditions general vasodilatation; increased secretion of urine; increased secretion of milk. One is warned against accepting these results as proof of the function of the posterior lobe. Injections of the anterior lobe are inactive, but removal of the anterior lobe is fatal in a few days, in the cases of dogs. Partial removal causes a condition similar to acromegaly. It is not certain whether undersecretion or oversecretion produces symptoms of acromegaly. E. C. E.

Cataract Treated by Subconjunctival Injections of Potassium Iodid.

SCOTT-MONCRIEFF, W. E. (*Ophthalmology*, July, 1913). As a result of the treatment of a few cases of senile cataract by subconjunctival injections of iodid of potassium, the

writer thinks the method has a favorable influence in at least delaying the development of the lenticular changes. A 1 per cent solution was employed, and sometimes acoin was added.

E. C. E.

The Value of the Gallemaerts' Magnetometer in the Diagnosis of Intraocular Foreign Bodies.

DANIS, MARCEL (*Ophthalmology*, July, 1913). This is a description of an instrument on the order of the sideroscope, which is used with much satisfaction in Gallemaerts' clinic. A table of seventy cases is given, in none of which did the magnetometer fail to indicate the foreign body, a better record than the X-ray, as used by the author, has given.

E. C. E.

Some Experiments Concerning the Lymph Vessels of the Eye and the Orbit.

LEBOUCQ, M. (*The American Journal of Ophthalmology*, August, 1913), made a number of experimental injections into the anterior and vitreous chambers of a rabbit, and arrived at the following conclusion:

- (1) There is an intraocular lymph circulation.
- (2) That this circulation takes place in the following manner:

(a) The aqueous humor of the posterior chamber is secreted by the anterior ciliary processes; that of the anterior chamber comes from the anterior surface of the iris, especially at the large and small arterial circles (Hamburger, Wessley).

(b) The aqueous humor is very slowly eliminated. That from the posterior chamber is poured into the anterior, probably through the pupil; a minimal part passes through the endothelium and Descemet's membrane, and nourishes the deepest layers of the cornea; another part enters the iris through the pupillary stomata, and perhaps through certain places in its anterior surface. The largest part goes to the iris angle and Fontana's spaces, into which the lymph from the iris stroma is also directed. At this locality the liquid flows out into the lymph spaces surrounding Schlemm's canal and the anterior ciliary veins. Into these spaces, furthermore, other lymph lacunæ are emptied, which come from the scler-

rotic and the cornea; these lacunæ lead the lymph of the cornea into the perivenous spaces. Having passed through the limbus the spaces continue on in the shape of lymph vessels, first surrounding, later on accompanying, the veins; these empty into the jugular vessels which accompany the inter-jugular vein.

(c) There is no other way for the outflow of the aqueous humor, either by the venous system or by the lymph spaces of the posterior part of the eye.

(d) The posterior lymph circulation is independent of the anterior one; it comprises that of the vitreous body and of the choroid.

(e) The lymph is secreted from the posterior part of the ciliary process and the ciliary retina. It leaves the globe exclusively by the lymph sheaths surrounding the vessels of the optic nerve, and from there probably passes into the lymph vessels running side by side with the central, and then the ophthalmic vein. It never reaches the anterior chamber or the perichoroidal space.

(f) The lymph secreted by the numerous choroidal vessels is collected in the perichoroidal space; this forms a blind sac ending forwards at the insertion of the ciliary muscle, backwards at the choroidal ring of the papilla.

The fluid is eliminated from this space by the lymph sheaths of the vorticosc veins. These sheaths continue, probably around the veins outside of the sclerotic, and become lymph vessels running side by side with the large veins; at any rate, they do not empty into Tenon's space.

(g) The subconjunctival space and Tenon's space are independent of the lymph circulation of the eyeball.

(h) The lymphatic system of the orbit may be explained in the following way: The efferent veins of the eyeball (anterior ciliary veins, vorticosc veins, central retinal vein) are surrounded by lymph sheaths where they leave the eyeball. These sheaths serve to empty the aqueous humor (around the anterior ciliary veins), the lymph of the vitreous body (around the central vein), and the lymph of the perichoroidal space (around the vorticosc veins). These sheaths in the orbit continue on in the lymph vessels accompanying the veins and act as contributors or sources for the jugular lymph trunk.

E. C. E.

Corneal Fistula and Iridectomy.

BEY, SAMEH (*Ophthalmology*, July, 1913). Fistulæ of the cornea present themselves as small black points surrounded by little bands of grayish white cicatricial tissue. There is great danger from infection, and, if the fistula closes, from secondary glaucoma, unless the fistula reopens, which it usually does. The author advises iridectomy, and states that he has performed this operation sixty-five times altogether for corneal fistulæ, with good results. There is difficulty in making the incision, on account of the shallow anterior chamber. "To overcome this, I introduce the point of the knife only in the corneal limbus, for a distance of a millimeter, so that it may be just visible. After its passage into the cornea I carefully push it parallel to it and the iris for one-third of its length. After removing it one can readily draw the iris out of the wound by means of forceps and then excise it."

E. C. E.

Two Cases of Nevus of the Conjunctiva Bulbi.

ALT, ADOLF (*Amer. Jour. of Ophth.*, Vol. XXX, No. 10). The study of two cases of conjunctival nevus sheds some light on the origin of these growths. Some maintain that they originate from connective tissue cells (Ribbert), and others that they come from the epithelial cells, especially the basal layer (Unna). The specimens shown are clearly of epithelial origin, and are of special interest in their tendency to break through the basal membrane and form cylinders and clusters in the underlying tissues. This epitheliomatous tendency would justify the early removal of every conjunctival nevus.

E. C. E.

Severe Iridocyclitis With Hypopyon Following Cataract Extraction.

GREEN, JOHN, JR. (*Amer. Jour. of Ophth.*, Vol. XXX, No. 10). Six days after a combined extraction in a fairly good subject, aged sixty years, iridocyclitis developed, and was treated by atropin, dionin and hot packs, with calomel internally. On the eighth day urotropin, grains seven and one-half every two hours, was given, and the eye began to improve after seventy-five grains had been taken. Ultimately vision was 5/8 +. The good result is attributed to urotropin,

which Gradle has shown to be excreted into the anterior chamber, and that this excretion is increased by paracentesis of the anterior chamber and by mydriatics. E. C. E.

Keratitis Disciformis—Prompt Recovery Following Subconjunctival Saline Injections.

GREEN, JOHN, JR. (*Amer. Jour. of Ophthal.*, Vol. XXX, No. 10), reports the case of a man, aged forty years, in good physical condition, who presented an inflammation of the left eye, of two months' duration, with moderate inflammatory phenomena. There was a circular gray corneal infiltration, reducing vision to 1/50. Several weeks of treatment with silver nitrate, argyrol, hot irrigation and dionin produced no result. Saline solution was given subconjunctivally, with prompt improvement, and was repeated weekly for two months. Vision was 5/25 in one week, and ultimately 5/8 +.

The sharp outline of the infiltrated area distinguishes this affection from keratitis profunda. Its cause is unknown, its course is chronic, it is a self-limited disease, and treatment, except for the subconjunctival injections in this case, is of no avail. E. C. E.

Myopia—Etiology and the Optical Management.

LEFEVER, C. W. (*Ophthalmology*, Vol. X, No. 1, October 13, 1913), draws the following conclusions after a short paper on myopia:

1. The myopic eye must be looked upon as a sick eye.
2. Its chief ailment is poor nutrition to the vascular coats.
3. This induces atrophy, thinning and reduced support to the sclera.
4. The lessened resistance in the wall of the eye induces more myopia, establishing a vicious cycle in which myopia produces atrophy, and atrophy produces more myopia.
5. The best optical management of myopia is full correction, constantly worn, because it increases the nutrition and strengthens the wall of the eye.
6. Near use of the eye is not a cause of myopia and should be encouraged as an aid in the treatment, except where there is a recent destructive lesion, as macular hemorrhage, rupture of the retina, detachment, etc. E. C. E.

The Mirror Sight for Firearms.

SCHANZ, F. (*Ophthalmology*, Vol. X, No. 1, October 13, 1913). To overcome the difficulty that presbyopes experience in shooting accurately, the mirror sight is suggested, since the trouble is due to the difficulty of seeing the nearer rear sight. The foresight is replaced by a small semicircular mirror, in the center of which is a black dot from which a point projects up above the upper edge of the mirror. In place of the rear sight is a small white disc. In sighting, the image of this disc is caught in the mirror, and is easily seen, since it appears to be twice the length of the gun barrel from the eye of the marksman. The white circle forms a larger image in the mirror than the size of the black dot, and the firearm is known to be straight when the periphery of this image shows as a white circle around the black dot. The projecting point is then made to coincide with the target. The white circle can be transilluminated by a small battery if desired, for shooting in reduced light.

E. C. E.

Report of a Case of Infection Following the Extraction of Cataract.

WOODRUFF, H. W. (*Ophthalmology*, Vol. X, No. 1, October 13, 1913). On the third day following a combined extraction in a man who was a good subject and whose conjunctiva gave a negative smear, a distinct hypopyon appeared, with a white line along the edge of the corneal wound. A subconjunctival injection of eight minims of 1/1000 cyanid of mercury, with four minims of 4 per cent cocain solution, was given. The xerosis bacillus was found in the secretion in the line of incision. In eight hours a second subconjunctival injection was given. The next morning the hypopyon was gone, and a slow recovery followed, with vision 6/20. The author refers to another case of infection in which the eye was saved by injecting argyrol into the anterior chamber, and another by applying the galvanocautery to the corneal wound. He likes the cyanid of mercury injection better, and urges its early use.

E. C. E.

Report of a Case of Dacryocystitis Presenting Several Complications, Including Orbital Abscess and Optic Neuritis.

SNELL, ALBERT C. (*Ophthalmology*, Vol. 10, No. 1, October 13, 1913). A man, aged sixty-five years, had suffered from

lacrimal disease for several years, and presented himself with a swelling over the sac, from which mucopus ran through the canaliculi on pressure. Six weeks later there was a fistula over the lower end of the sac, and from this a large quantity of pus ran when the eyeball was pressed upon, and a probe entered the fistula for a distance of two and a half inches, backward. Prolonged irrigation not availing, the sac was removed and an opening made into the nose. A small area of necrotic bone was encountered. A mild optic neuritis had developed. After this operation the discharge from the orbit gradually ceased, but that from the sac was kept up by a piece of mucous membrane, till that was dissected out. Ultimate recovery occurred at the end of eleven months, vision 20/100. There was no record of the vision at the beginning of the trouble.

E. C. E.

Keratoconus With Reports of Cases.

WEEKS, JOHN E. (*Archives of Ophthalmology*, September, 1913), describes keratoconus, the etiology, symptoms and anatomic findings. He then gives histories of nine cases seen by him which did not require operative treatment.

Nonoperative treatment, in his opinion, lies in attention to the health in the early stage of the development of the disease, and care in the use of the eyes. Locally, he uses pilocarpin and a light compress bandage at night over a period of six to eight months. Suitable glasses are ordered.

He then goes on to describe the operative treatment, and reports five cases in which an attempt was made to reduce the tension of the eye and to maintain hypotony for as long a period of time as possible by performing an iridectomy; and then at the end of one to two weeks, by the cauterization of the apex of the cornea, followed by pilocarpin and a compress bandage.

Cauterization is performed at the apex of the cone, an oval area with its long axis horizontal being treated. The cauterized area seldom extends above the horizontal meridian of the cornea.

From his cases he draws the conclusion that when the vision has fallen to 8/200 or less through keratoconus, it may be improved very much by this operative procedure.

In one case a recurrent detachment of the epithelium over the cauterized area developed.

G. S. D.

Two Cases of Chronic Glaucoma Simplex Treated by Iridotaxis.

HARROWER, DAVID (*Archives of Ophthalmology*, September, 1913). Borthen modified Holth's operation of iridencleisis by simply including a fold of iris in the wound, allowing its posterior surface to coalesce with the subconjunctival tissues. The conjunctiva is incised 10 mm. back of the upper limbus. Flap dissected down close to the scleral surface of the limbus. Incision is made in the sclera 1 mm. back of the sclerocorneal margin and carried forward until it is 4 to 5 mm. long. Iris is grasped at the sphincter, and a fold is drawn out through the section and left there.

A drop of atropin is instilled before the operation to insure permanency of the prolapse.

Borthen reports remarkable results from this operation on cases observed from two months to two years.

Harrower now adds two to the number; the first observed over a period of ten months, and the second for nine months. The result at the end of this time was excellent. The tonometer was not used.

G. S. D.

The Experimental Production of Sclerokeratitis and Chronic Intraocular Tuberculosis.

VERHOEFF, F. H. (*Archives of Ophthalmology*, September, 1913). Three years ago Verhoeff brought forward the theory that infection in tuberculous scleritis and keratitis reached the sclera and cornea by way of the aqueous and ligamentum pectinatum. He assumed that the bacilli reached the aqueous from the ciliary processes. He now adduces experimental evidence to support this theory.

In the first part of his paper he discusses the work of Stock, who produced numerous tubercular lesions of the eye by the injection of living bacilli into the ear vein of rabbits. Verhoeff believes that Stock's experiments have little significance for ocular tuberculosis in the human eye, since in his work large numbers of virulent bacilli were suddenly introduced into the blood stream, a condition very different from that which obtains in the human.

Since in most cases of human tuberculosis the lesions are of a relatively mild type and ultimately heal, the bacilli must be inactive. Therefore, Verhoeff injected dead bacilli into rab-

bits' eyes, in the hope that lesions similar to those of the human might be produced.

He now reports that when dead tubercle bacilli in sufficient numbers are introduced into the vitreous or the anterior chamber, after about three months nodules in the corneosclera appear which simulate those found in the human. Usually the ciliary body is also involved. Tubercles also occur in the iris, rarely in the retina, and not infrequently in the choroid. He believes that tubercles of the choroid are produced from the wandering of the bacilli from the filtration angle along the postchoroidal space.

Since it is now well established that the aqueous is relatively free from immune substances, except following a paracentesis or an active intraocular inflammation, it seems possible that frequent paracentesis of the cornea would have a favorable effect in checking the progress of a tuberculosis of the anterior segment of the eyeball.

The article should be read in the original, since it does not lend itself well to the abstract. G. S. D.

Report of a Case of Microphthalmus With Orbital Cyst Right; Partial Microphthalmus With Intraocular Changes Left.

CALHOUN, F. PHINIZY (*Archives of Ophthalmology*, September, 1913). In this case the right eye appeared to be absent, but there was a prominent cystic swelling of the lower lid. By careful examination a contracted globe was discovered deep in the orbit. This, and a well-defined, fairly thick-walled cyst, was removed.

The left eye showed a rotary nystagmus. Lens clear. White bands of tissue were scattered throughout the vitreous. No outline of the nerve could be made out, but a few retinal vessels ran to a common center, from which numerous white connective tissue bands expanded into the vitreous.

Histologic examination of the right eye showed typical microphthalmus with an orbital cyst. G. S. D.

Report of a Case of Traumatic Equatorial Rupture of the Sclera.

KNAPP, ARNOLD (*Archives of Ophthalmology*, September, 1913). Patient, sixty-eight years old, fell, striking the left eye against a table. Examination showed very red eye, deep an-

terior chamber, upper part of iris forced back, lens in place, no fundus reflex, tension not reduced.

Ten days later retraction of the upper lid showed a bluish, slightly raised area under the conjunctiva up and out. Tension good.

The eye was enucleated, and showed an equatorial rupture 10 mm. long and 2 mm. posterior to the insertion of the rectus externus.

Equatorial ruptures of the eyeball are extremely rare.

Remarkable fact about the case was the preservation of normal tension, and the bluish area on the sclera, which proved to be an hematoma in Tenon's capsule. G. S. D.

Unusual Types of Punctate Cataract.

HOLLOWAY, T. B. (*Ophthalmic Record*, August, 1913), describes seven cases of unusual types of punctate cataract. Cases 1, 2 and 3 were of the same family. In a general way they showed numerous, irregular, rounded, small dots of a bluish tint scattered throughout the lens, in addition to linear opacities of shapes varying in the different cases.

The other four cases showed somewhat analogous, dot-like opacities in various parts of the lens associated, as in the first cases, with central anterior or posterior opacities.

He regards the cases as congenital, and is not sure whether the condition is a stationary one or not.

An extremely good description of each case is given.

G. S. D.

Orbital Cellulitis Caused by Staphylococci.

MUNCASTER, S. B. (*Ophthalmic Record*, August, 1913), describes severe case of orbital cellulitis apparently successfully treated by staphylococcus vaccines.

G. S. D.

A Reflecting Book Marker for Teaching Readers How to Avoid Eyestrain.

RHOADS, JOHN NEELY (*Ophthalmic Record*, August, 1913). This is a marker constructed of bright aluminum, with instructions stamped on it of how to hold a book to avoid injurious reflections. Rhoads advises that one of these markers should be attached to every book.

G. S. D.

A Huge Orbital Osteoma.

BLAKE, A. M. (*Ophthalmic Record*, August, 1913), describes a large osteoma of the left orbit in a negro of 82 years. The paper is illustrated by a good photograph and an adequate X-ray.

G. S. D.

An Early Sign of Paresis of the Facial Nerve.

ROCHESTER, ALEXANDER (*Ophthalmic Record*, August, 1913). The patient is told to close both eyes lightly. The observer then grasps patient's hand, holds it in front of his face, and directs the patient to look in the direction of the hand, while he keeps the eyelids lightly closed.

The hand is then gradually raised until it is beyond the upper border of the field of fixation.

If there be any paresis of the facial nerve, the lid on the affected side will be held closed with much more difficulty than its fellow, and it will open slightly.

G. S. D.

Sarcoma of the Orbit Following Mules' Operation.

WOOD, DOUGLAS (*Ophthalmic Record*, August, 1913). A child, three and one-half years old, gave a history of a fall from a chair two months previously. There was slight ciliary injection. Lens was cataractous and dislocated, when first seen. As secondary glaucoma developed, the eye was eviscerated and a glass ball inserted in the sclera.

Three months later there was pain, redness and swelling of the stump, and it was removed. A tumor involving the optic nerve was found, and the orbit was completely eviscerated.

Recurrence and mediastasis occurred, and the child died.

The original growth was pronounced "small cell sarcoma."

G. S. D.

Fixation Forceps.

ALLPORT, FRANK (*Ophthalmic Record*, August, 1913). This is a small, slender forceps without a catch. The ends are round to avoid tearing the conjunctiva. The inside of the ends have no teeth, but are serrated.

G. S. D.

The Management of Foreign Bodies in the Eye and Orbit.

STIEREN, EDWARD (*Ophthalmic Record*, September, 1913), reports his experience, based on 180 cases of foreign body in

the eyeball and 26 of foreign bodies in the orbit. He believes in operating on a traumatic cataract at once.

Foreign bodies in the vitreous should not be removed by way of the anterior chamber, for there is much less traumatism if the tip of the magnet is inserted in the scleral wound at the place nearest the foreign body. Steel and lead seem to remain in the orbit and to create no trouble. Copper and brass, and glass and wood, are prone not to remain quiet. G. S. D.

Hole at the Macula.

BRADBURN, A. A. (*Ophthalmic Record*, September, 1913). In the right eye of a girl, age ten years, between the disc and the macula was a triangular white area with its base toward the disc and the apex at the macula. No sign of macula could be made out. The edges were unpigmented, and showed evidence of a thinned out choroid. Vision in this eye with correction was 5/12. Bradburne regards this as a congenital absence of choroid and retina. G. S. D.

Report of Case of Spontaneous Dislocation of Both Lenses Into the Vitreous.

McALLISTER, J. C. (*Ophthalmic Record*, September, 1913). Patient, age sixty years, complained that suddenly she had gone nearly blind in her one good eye. Twenty years previously the same thing had happened in the other eye.

Examination failed to locate either lens, but V. R. + 11. sp. = 6/22. V. L. + 12. sp. \ominus cyl. = 6/13. G. S. D.

Complete Bilateral Aniridia—Ectopia Lentis—Pathologic Cupping of the Discs.

HOLLOWAY, T. B. (*Ophthalmic Record*, September, 1913). A boy, age ten years. Horizontal nystagmus. Complete absence of iris with a dislocation of the lens directly upwards, the lower margin of each lens being at about the center line of the cornea. The lower margin of each lens seemed to be less convex than normal.

The disc showed marked pallor, with deep cupping and characteristic bending of the vessels at the margin of the cup. There was a question of increased tension of one eye. Owing to nystagmus, tonometer could not be used.

The change in curvature of the lower portion of the lens was doubtless due to an increase in the anteroposterior dimension, owing to the absence of a portion of the suspensory ligament.

The author calls attention to Wessely's observation of a case where iridectomy was performed for buphthalmus at five months of age, and at the age of three years a distinct coloboma corresponding to the iridectomy coloboma could be noted. Wessely has also experimentally produced coloboma of the lens in rabbits by performing an iridectomy on the first day of life.

Holloway discusses the causation of glaucoma in eyes with complete absence of the iris.

Collins has pointed out that predisposition to glaucoma is due to a very rudimentary iris stump, and adhesions pass from the anterior surface of the iris to the pectinate ligament.

G. S. D.

A Case of Pulsating Exophthalmos.

MATHEWSON, GEORGE H. (*Ophthalmic Record*, September, 1913). Man of thirty-two years was thrown from the top of a car and sustained a fracture of the skull. Four weeks after the injury the left eye showed a typical picture of pulsating exophthalmos. The vision was much diminished, probably due to laceration of the optic nerve from the fractured skull which he sustained.

Ligation of the common carotid was advised and performed, and one month later the condition appeared relieved.

G. S. D.

A Case of Pemphigus of the Conjunctiva.

BORDLEY, JAMES, JR. (*Ophthalmic Record*, September, 1913). The disease began with the appearance of bullæ on the body and limbs of a man, aged thirty-nine years. The course was progressive, and death occurred in about four months.

Numerous hemorrhages in the conjunctivæ occurred, which were so abundant that the conjunctiva was forced well over the cornea. Absorption of the hemorrhages took place, and the conjunctiva returned to normal. A few bullæ at the skin margin of the lower lids.

G. S. D.

Cacodylate of Sodium in a Case of Keratoiritis Due to Lime Burn.

ALLPORT, FRANK, AND ROCHESTER, ALEXANDER (*Ophthalmic Record*, September, 1913). In this case the cornea was completely opaque and the patient had all the symptoms of an acute iritis. Seven injections of cacodylate of sodium, usually three and one-half grains, were given at intervals of several days. Two or three days after the first injection cornea gradually began to clear, and finally patient obtained 20/20 vision. The usual local treatment was used. The writers believed that the cacodylate of sodium exercised a specific action in this case.

G. S. D.

A Hitherto Undescribed Anomaly of the Macular Retina.

GRADLE, HARRY S. (*Ophthalmic Record*, October, 1913), describes three cases presenting a somewhat similar condition in the fovea. A dark red fovea was surrounded with a grayish red zone sharply demarcated on the foveal side and gradually fading into the normal fundus toward the periphery. Foveal edge was distinct, and seemed to be perpendicular. Dark gray zone apparently was composed of light reflexes and partly of a grayish opacity in the innermost layers of the retina. He believes that there was an increase in thickness of the innermost retinal layers.

G. S. D.

The Implantation of Fat in Tenon's Capsule.

SPRATT, CHARLES NELSON (*Ophthalmic Record*, October, 1913). The fat is obtained from the abdomen and a large piece is inserted into Tenon's capsule and the muscles sutured over. The advantage of using fat over paraffin, glass or metal balls is that it forms a sterile, autogenous graft, which has less tendency to change its position than do any of the foreign substances.

G. S. D.

The Care of School Children at Moorfields.

BROWN, SAMUEL HORTON (*Ophthalmic Record*, October, 1913). The method here described offers some valuable suggestions for the handling of school children in hospital clinics.

G. S. D.

Burn of Eyeball Due to Caustic Contents of Golf-Ball.

CRIGLER, L. W. (*Ophthalmic Record*, October, 1913). The eye represented the picture of typical caustic burn of cornea and conjunctiva. As is common in these cases, the vision was much impaired as a result of the injury. G. S. D.

Cataract Extraction With Conjunctival Bridge.

LAMB, ROBERT SCOTT (*Ophthalmic Record*, November, 1913). In this operation the procedure in making the incision is the same as that used in the extraction with a conjunctival flap, except that the superior border of the flap is not severed but is left intact. During expression of the lens the bridge is lifted by a spatula. The possible advantages and disadvantages of this procedure are obvious. G. S. D.

Lid Elevator.

FISHER, W. A. (*Ophthalmic Record*, November, 1913). Fisher has made a double Smith hook on one end of his lid elevator, and claims that its use requires much less skilled assistance than does the lid hook of Colonel Henry Smith. G. S. D.

A New Irrigation Basin.

CLARK, I. G. (*Ophthalmic Record*, November, 1913). The basin is devised to take care of a large volume of fluid required where extensive flushing of the conjunctival sac is used. Its four borders represent composites of twenty-five form curves of the facial malar region so that it is said to fit any face easily. G. S. D.

Existence and Prevalence of Trachoma Among the Indians of the Northern United States and Canada.

HARRISON, W. H. (*Ophthalmic Record*, November, 1913). In the writer's several years' service for the United States government, investigating and treating trachoma among the Indians west of the Mississippi River, he has found but one small band wholly free from trachoma, while other groups of the same tribe (the Chippewa) are alarmingly affected. During an investigation of the Canadian Indian reservation near Fort William, Ontario, not a single case of trachoma was

found. Dr. Harrison quotes a statement on the scarcity of trachoma among the Canadian Indians, and states that he has seen many cases of trachoma among them. G. S. D.

Report of a Case of Sarcoma of the Orbit.

IDE, CLARENCE EDWARD (*Ophthalmic Record*, November, 1913). A child less than a year old, with a history of injury, showed a protruding eyeball. A Krönlein operation was performed, and a soft pulpy mass was found behind the globe and extending into the antrum. It is stated that the mass was a sarcoma. The child died a week later. G. S. D.

Orbital and Ocular Neuralgia Due to Dental Irritation.

WUERDEMANN, H. V. (*Ophthalmic Record*, November, 1913), reports a case of pain back of the eye. An upper molar of the same side was gold-capped and sensitive. Extraction of the tooth was followed by relief of the pain.

G. S. D.

ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

BY

ALBERT C. SAUTTER, M. D.,

PHILADELPHIA.

MAX W. JACOBS, M. D.,

ST. LOUIS.

Two Cases of Congenital Malformation of the Lids.

LOEWENSTEIN (*Prager med. Woch.*, 1913, No. 25; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, September 11, 1913) reports two such cases. In the first, the lateral half of both lower lids was drawn outward, proboscis like. There was eversion, the lower punctum being 6 mm. distant from the internal canthus. Complete ptosis, slight lagophthalmos.

In the second case, occurring in a three-months-old child, there was a triangular coloboma of both upper lids, including the whole thickness of the lid. Ordinary lid closure left a triangular portion of the globe exposed, the lateral dimension being $2\frac{1}{2}$ mm. There was inability to raise the upper lid. The coccyx was replaced by a skin appendage.

Regarding the genesis of these malformations, he is in accord with van Duyse, who ascribes them to the results of pressure and constriction by amniotic bands. A. C. S.

Ptosis Congenita With Collateral Inheritance.

GINZBERG (*Klin. Monatsbl. f. Augenheilk.*, April, 1913) describes the children of a normal parentage in which the first member's eyes were normal, the second had ptosis in one eye, the third a marked ptosis of both eyes, the fourth a double-sided ptosis of mild degree, and the fifth had normal eyes. He quotes Manz as offering the most likely hypothesis in such cases. The latter suggested that an unknown pathologic factor which is potent only during a certain period corresponding

to the development of certain fertilized ova exerts its influence either through the blood or generative system of the mother.

M. W. J.

Persistence of Remains of the Fetal Pupillary Membrane.

STAEHLI (*Klin. Monatsbl. f. Augenheilk.*, April, 1913) examined 1600 eyes of 800 patients with the aid of the Nernst lamp. None of these patients had ever had an iridocyclitis or iritis. He found persistent remnants of fetal pupillary membrane in 63.25 per cent. Like other investigators, he found the remains most often in dark eyes (80 per cent), 35 per cent occurring in light colored irides. While the punctate form was most common in persons with dark irides, the fine, spider-web-like remains were found by actual count twice as often in light colored eyes. While his investigations throw no light on the question, still Staehli is of the opinion that in all probability the fact that remains are seen in one person and not in another will be found in accord with the general laws of heredity.

M. W. J.

Contribution to the Formation of Rosette-like Structures in the Retina of Fetuses Otherwise Normal.

LINDENFELD (*Klin. Monatsbl. f. Augenheilk.*, April, 1913) does not think that the rosettes and folds of cells in the inner and outer nuclear layers of the retina observed in her material can be considered primary types of glioma. The undifferentiated cells which she found at the ora serrata possibly represent the origin of such growths, but further examinations must be made to ascertain whether such changes in the retina can be induced by the Roentgen rays. Lindenfeld's material was obtained from fetuses five to eight months old, whose mothers had been exposed to X-ray therapy during pregnancy. In the cases described by Seefelder and Gilbert, quoted by Lindenfeld, the rosettes were invariably found at some distance from the ora serrata and were thought to be primary glioma cells.

M. W. J.

The Hyaloid Canal in the Eye of the Pig.

V. SZENT-GYOERGYI, Budapest (*Graefe's Archiv. f. Ophthalm.*, 1913, Vol. 85, Part 1: Abst. in *Woch. f. Ther. u. Hyg. des Auges*, August 14, 1913), by special laboratory methods

proved the existence of a hyaloid canal in twenty-five full grown pigs. A hollow canal, however, was never found; only a rather sharply differentiated axial portion of the vitreous, which he calls the tractus hyaloideus corp. vitrei. The fibrillæ in this tract were coarser and more loosely arranged. A similar canal was found in the guinea pig, rabbit, squirrel, ox and mouse. It was never found in amphibians, but in the reptile and turtle, excepting the lizard and snake. A. C. S.

Keratoconus.—Its Relationship to Internal Secretion and to Intraocular Pressure.

STREBEL AND STEIGER (*Klin. Monatsbl. f. Augenheilk.*, March, 1913) found no shortening of coagulation time in patients with this condition, although Siegrist and Kottmann found the contrary. Strebel and Steiger report a higher blood viscosity, but normal intraocular tension. Siegrist and Kottmann found a chain of symptoms pointing toward hypothyroidism, but in their conclusions state that various other factors are apparently essential to the appearance of keratoconus. Strebel and Steiger fed two patients with thyroid without any change resulting in the corneal condition. They believe that the developmental factor is of no consequence, as the condition comes on only after puberty. Axenfeld's symptom, anesthesia of the tip of the keratoconus, if not a secondary phenomenon, according to Strebel and Steiger, points to a neurotic influence as a possible etiologic factor. The opacities seen at the apex of the cornea in this condition are found to lie in the deeper portions of the stroma, and corneal nerve fibers could be traced to them. They therefore suggest that keratoconus is due to a nervous disturbance. Whether the latter is due to a pathologic condition of the internal secretions remains unexplained. M. W. J.

The Etiology and Therapy of Keratoconus.

AUGSTEIN (*Klin. Monatsbl. f. Augenheilk.*, April, 1913) concludes from the general appearance of his case, from the result of the blood examination and the successful treatment with thyraden, that the fundamental reason for the condition in this patient, in whom the keratoconus was only one symptom, was a disturbance of internal secretion. The seat of

the trouble was probably the thyroid. Keratoconus with congenital malformations must be differentiated from keratoconus without malformations. The latter variety appears in early life as a symptom of a general disease, and is to be explained on the basis of a trophic disturbance of the cornea. These are analogous to the trophic changes in the skin and its appendages which stand developmentally in the same relation to the skin as does the corneal epithelium. M. W. J.

Normal and Albinotic Pigmentation of the Iris.

FUCHS, Vienna (*Graefe's Archiv. f. Ophthalm.*, 84, Part 3; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, October 23, 1913). A normal iris, even though gray or blue, is impervious to transmitted light. Only when there is defective pigmentation of the retinal layer is transillumination of the iris easy. In these cases vision is impaired and nystagmus generally present. In the half albinos there is also defective pigmentation of the retinal layer. A. C. S.

Eye Anomalies in Congenital Family Deafness and in Labyrinth Disease.

VAN DER HOEVE (*Klin. Monatsbl. f. Augenheilk.*, April, 1913) found that those cases of labyrinthine disease which exist with retinochoroiditis and which come on after birth have a syphilitic basis. He thinks the relationship between congenital deafmutism and the eye disease a closer one than present statistics seem to indicate. In 1009 cases of congenital deafmutism 39 had retinitis pigmentosa, whereas in 2000 individuals in whom the affection developed later in life, not one showed signs of this affection. He therefore believes that retinitis pigmentosa occurs but rarely in deafmutism acquired some time after birth, but is fairly frequent in the congenital cases. He believes that the eye and ear conditions are due to a disease of the central nervous system which Hammer-schlag has sought to explain along congenital lines. Van der Hoeve thinks that all cases of deafmutism ought to be examined ophthalmoscopically, so that those having retinitis pigmentosa may be educated in a manner which will prevent their utter helplessness when total blindness overcomes them.

M. W. J.

The Atypically Situated Conus.

TERTSCH, Vienna (*Gräfe's Archiv. f. Ophthal.*, 84, 3; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, October 23, 1913), states that inferior conus is almost always associated with corneal astigmatism, poor visual acuity and developmental anomalies, all of which suggest a general developmental disturbance of the eye. The cases of inferior conus associated only with developmental disturbances of the sclera and choroid should not be separated from coloboma of the nerve entrance. Anatomic examination of a case of superior conus, a rare anomaly, showed its formation due to the same factors responsible for a conus below.

A. C. S.

Concerning the Biology of Inclusion Blennorrhoeal (Trachoma) Virus.

LINDNER, K. (*Gräfe's Archiv. f. Ophthal.*, 85, 1, February, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, August 28, 1913), made experimental inoculations in a number of monkeys to throw light on the question concerning the etiologic identity of trachoma and inclusion blennorrhoea. He arrived at the following conclusions:

1. The inclusion blennorrhoeal virus by direct inoculation seems almost absolutely infectious to the conjunctiva of the pavian.

2. Inclusions and free initial bodies are frequently found in great numbers in the acute cases, but in the chronic cases they are more sparsely represented.

3. A single infection with inclusion blennorrhoeal virus results in a brief immunity against reinfection.

4. The virus is most unstable; moisture and heat acting detrimentally.

Inasmuch as a single infection with trachoma affords a certain immunity against subsequent infection with inclusion blennorrhoeal virus, Lindner is strongly convinced that trachoma and inclusion blennorrhoea are etiologically identical.

A. C. S.

Epithelial Inclusions and Trachoma.

LOEHLEIN (*Gräfe's Archiv. f. Ophthal.*, 84, 3; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, September 4, 1913) holds to his former views, that the inclusions represent microorgan-

isms which are capable of producing in different mucous membranes a relatively benign chronic inflammation. These micro-organisms may be considered the etiologic factors only in benign chronic urethral and vaginal catarrhs, and intrapartum may be transferred with the production of an inclusion conjunctivitis in the newborn.

A. C. S.

The Question of Anaphylactic Phenomena in the Cornea.

WESSELY (*Klin. Monatsbl. f. Augenheilk.*, April, 1913) calls attention to the fact that his article on the above topic, which appeared in the *Münch. med. Wochenschr.* (1911, No. 32), and quoted recently by v. Szily and Arisawa in this journal, was the result of very thorough investigation, even if reported in a comparatively short article. He maintains that v. Szily and Arisawa have added but little to what he reported in 1911.

M. W. J.

On the Literature of Anaphylaxis in Ophthalmology.

V. SZILY (*Klin. Monatsbl. f. Augenheilk.*, April, 1913) replies to Wessely's communication in this same number of the *Klin. Monatsbl. f. Augenheilk.*, giving him due credit for the work he has done.

M. W. J.

On the Pathology of the Conjunctiva.

WAGENMANN, Heidelberg (*Gräfe's Archiv. f. Ophthalm.*, 84, 3; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, October 23, 1913), reports three cases of conjunctival tumor formation—1, teratoid osteoma; 2, hyalin tumor of the semilunar fold; 3, sebaceous adenoma of the caruncle. He also reports a case of supernumerary caruncle. Cases two and three stand alone in the literature. Case one is not such a rare condition; it always, as in the author's case, occurs in females. The last case is the third case of supernumerary caruncle so far reported.

A. C. S.

Contribution to Our Knowledge of Weakened Tuberculosis (abgeschwächten Tuberkulose) of the Conjunctiva (Conjunctivitis Parinaud).

STERN (*Centralbl. f. prakt. Augenheilk.*, November, 1912) transplanted portions of the diseased conjunctiva into the

peritoneal cavity of guinea pigs, but these were merely absorbed. Similar material transplanted to the iris of a rabbit gave rise to typical tuberculous foci, which after introduction into the peritoneal cavity of a guinea pig, quickly gave rise to tuberculous lesions resulting fatally. Tubercle bacilli could not be found in the tissues of the conjunctiva, but the lesions produced by the affected tissue showed the organisms in considerable number. Stern therefore advocates the use of tuberculin.

M. W. J.

Diphtheritic Conjunctivitis, Conjunctival Diphtheria and Croupous Conjunctivitis.

HOOR (*Klin. Monatsbl. f. Augenheilk.*, March, 1913) discusses the advisability of coming to some definite understanding of the terms referred to in the title, which are now so often used interchangeably. Although diphtheritic conjunctivitis is usually diphtheritic infection of the conjunctiva, still the streptococcus may produce the severest type of diphtheritic conjunctivitis, as was shown by one of Hoor's cases. In his opinion we must differentiate between diphtheritis of the conjunctiva and croupous or pseudomembranous conjunctivitis, and only when Löffler's bacillus is found can we say diphtheria, regardless of whether the picture is that of diphtheritic or croupous conjunctivitis.

M. W. J.

Epithelial Tumors of the Cornea.

STEINOHRT (Inaug. Diss., Rostock, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, August 28, 1913) reviews the literature and describes a case, examination of which showed a corneoscleral tumor, the major portion of which revealed a typical epitheliomatous structure with marked development of the connective tissue bands and active proliferation of connective tissue from the cornea. On one side of the conjunctiva there was a distinct papillary formation with papillomatous proliferation without any trace of Bowman's membrane.

Steinohrt considers the case one of primary epithelioma of the cornea, basal cell carcinoma, causing secondarily papillomatous proliferation of the cornea.

A. C. S.

Corneal Fistula Due to Inclusion of the Capsule.

OPIN (*Ann. d'Ocul.*, June, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, October 23, 1913) publishes the microscopic findings in an eye operated upon for cataract with subsequent filtering cicatrix because of inclusion of the capsule in the wound. Vision had remained good up to the death of the patient, three years later. The eye had never shown signs of inflammation.

Anatomic examination showed the capsule folded, with no change in thickness or continuity, demonstrating the remarkable resistance of the capsule to absorptive processes. The wound also revealed tubular invagination of desquamated epithelial cells.

He believes that the secondary glaucoma, which frequently complicates inclusion of the capsule, is brought about, either by mechanical propulsion of the iris root by the capsule against the posterior surface of the cornea or by migration of conjunctival epithelial cells into the wound. A. C. S.

Concerning the Etiology of Phlyctenular Ocular Disease.

BELEKY-RASKIN (*Zeitsch. f. Augenh.*, Vol. 29, Part 6; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, August 28, 1913) subjected one hundred cases of phlyctenular inflammation to the v. Pirquet and Moro tests, the former being repeated in eight days in negative cases. The v. Pirquet test proved positive in ninety-two per cent, the Moro in eighty-five per cent.

Positive reactions occurred more frequently in the older patients. Some of the cases which did not respond were, nevertheless, tuberculous or suspicious cases. The writer is therefore strongly convinced that phlyctenular disease is a tuberculous affection. In a number of cases examination of the urine for indican gave a negative result. A. C. S.

Contribution to the Clinical and Pathologic Anatomy of Ocular Syphilis.

IGERSHEIMER (*Gräfe's Archiv. f. Ophthal.*, 84, 1, February, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, October 16, 1913). While the view generally prevails that the retina becomes secondarily affected by lues, in an eye enu-

cleated because of supposed glioma, Igersheimer found luetic disease of the retina without signs indicative of primary choroidal involvement. Furthermore, a clinical study of three cases showed that a specific uveitis may exist in conjunction with a specific retinitis unassociated with previous choroidal inflammation. He attributes the occurrence of a neuroretinitis after treatment of an iritis papulosa with salvarsan to the simultaneous invasion of iris and retina by the spirochetes.

A. C. S.

Histologic Examination of a Case of Luetic Iritis Papulosa.

ANDERSEN, L., Copenhagen (*Graefe's Archiv. f. Ophthalm.*, 84, 1, February, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, August 28, 1913), found no typical lesions of lues (no endarteritis, no giant cells, no epithelioid cells). The lesion was deeply situated in the iris in front of the sphincter.

A. C. S.

A Case of Tuberculosis of the Iris and Optic Nerve Sheath in the Bovine.

KOHN (Inaug. Diss., Rostock, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, August 14, 1913) describes the histologic findings in a case of primary tuberculosis of the iris with tumor formation. There was also a small cell infiltration of the sheaths of the optic nerve without involvement of the nervous elements. The infiltration was atypical.

A. C. S.

Concerning Chronic Endogenous Uveitis.

FUCHS, Vienna (*Graefe's Archiv. f. Ophthalm.*, 84, 2; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, October 16, 1913), includes under this term all forms of iritis, iridocyclitis and iridochoroiditis excepting the tuberculous, syphilitic and sympathetic varieties.

The irritant or toxin which acts upon the uveal surface must be contained in the aqueous in anterior affections. The toxins are conveyed to the eye by the blood stream and secreted with the aqueous by the vessels of the ciliary body and iris; or they may come to the aqueous by osmosis through the retina from the subretinal fluid.

In a third of the cases studied, the iris only was involved. The ciliary body, on account of its epithelial covering, is better protected against the action of toxins than the iris, which is covered anteriorly only by endothelium.

Because of peculiar vascular conditions the pupillary margin suffers the most, and next in severity the anterior surface of the iris, for reasons referred to above. The posterior surface of the iris and the ciliary processes usually remain free from inflammation.

A. C. S.

Anatomic Examination of Eight Cases of Luxation of the Lens With Special Consideration of the Changes in the Optic Nerve.

WAGENHAUSER, F. (Inaug. Diss., Tuebingen, 1912; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, August 28, 1913), publishes the clinical histories and microscopic findings in eight cases of luxation of the lens followed in seven by glaucoma. In one case of subconjunctival luxation without glaucoma, no glaucomatous changes and no vacuoles were found in the nerve. In the remaining seven cases with glaucoma, vacuoles were present in four cases. In long standing cases with total excavation of the nerve, vacuoles were absent, but present in the recent cases of glaucoma.

In every case but one the capsule was intact; in every case cataractous changes were present and the zonula severed at its lenticular attachment.

In the cases of luxation within the globe, the reactive changes in the vicinity were slight, excepting in one case, in which the nucleus without the capsule was luxated into the vitreous. In the case of subconjunctival luxation marked inflammatory changes were observed.

A. C. S.

Concerning the Question of Retinal Detachment.

OELLER, Erlangen (*Graefc's Archiv. f. Ophthalm.*, 84, 2; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, September 11, 1913), ascribes a case of total detachment of the retina in an eye enucleated because of high tension to: (a) Retro-retinal transudation from the choroidal vessels on account of difference in pressure between the choroid and vitreous. (b) The traction exerted by abnormally firm (due to degenera-

tive and proliferative changes in the pigment epithelium) adhesions between the vitreous and anterior portion of the retina. A. C. S.

Concerning the Pathologic Anatomy of Detachment of the Retina.

ISCHREYT (*Graefe's Archiv. f. Ophthalm.*, 84, 1, February, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, September 4, 1913). The writer's microscopic findings in two cases of retinal detachment lend further support to the Leber-Norden-son retraction hypothesis. A. C. S.

A Contribution to the Knowledge of Retinitis Exudativa.

HAJANO, Tokio (*Graefe's Archiv. f. Ophthalm.*, 84, 1, February, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, August 28, 1913), publishes the histologic findings in an eye enucleated for supposed glioma, but which proved to be one of exudative retinitis. However, there was no inflammation of the retina, but rather a degeneration consisting in vascular disease, multiple hemorrhages, degeneration of the retina with edematous infiltration. The affection was perhaps of congenital origin. He describes three other cases exhibiting different stages of the same disease process. A. C. S.

Concerning Isolated Tuberculous Focal Disease of the Choroid With Healing of the Tuberculous Process.

VOLAND (Inaug. Diss., Tuebingen, 1912; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, October 23, 1913) claims the healing of isolated tuberculous foci of the choroid is not such a rare occurrence, especially in individuals without other manifest tuberculous lesions. He describes five cases. In every case there was an acute, localized choroiditis in the region of the posterior pole, involving the macula or the perimacular region, complicated with a more or less pronounced optic neuritis. The disease picture very closely resembled "Sichel's circumscribed choroiditis" and "Michel's circumscribed tuberculous choroiditis." Nearly every case was kept under observation up to the atrophic stage. He considers the majority of the so-called macular colobomata nothing more than the atrophic termination of former central lesions.

A. C. S.

The Histologic Findings in Four Cases of Highgrade Myopia.

HAIST (Inaug. Diss., Tuebingen, 1912; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, August 21, 1913) found in four cases of high myopia without glaucomatous complications vacuoles in the optic nerve which resembled those described by Schnabel in glaucoma. The vacuoles were found only in the anterior portion of the nerve, between and behind the lamina cribrosa. There was also simple partial atrophy of the nerve with condensation of the septa and partial loss of the medullary sheaths.

A. C. S.

Vessels in the Vitreous in a Case of Panophthalmitis.

TERTSCH, Vienna (*Zeitsch. f. Augenh.*, Vol. 30, Part 1; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, October 16, 1913), in a case of panophthalmitis found that nearly all the retinal vessels projected into the infiltrated vitreous. The membrana limitans interna was almost completely destroyed, the remaining portions separated from the retina by a purulent exudate. There was distension of the inner retinal cells, and here and there small round cell infiltration. These findings, he thinks, suffice to explain the detachment of the retinal vessels from their supporting structures and their invasion of the vitreous. Congenital malformations could be positively excluded.

A. C. S.

Keratitis Punctata Tropica.

WESTHOFF (*Centralbl. f. praktische Augenheilk.*, October, 1912) describes a corneal inflammation which is followed by the formation of grayish spots in the superficial and middle layers. The condition is due to infectious material introduced by splashing mud into the eye while working in Javanese rice fields or occasionally by dust. Westhoff found structures resembling Herbert's intracapsular bacillus, and suggests calling the disease keratitis punctata tropica. He emphasizes that we are not dealing with superficial punctate keratitis.

M. W. J.

Fungoid Mass in the Tear Passages, With a Contribution to the Question of Streptotrichosis.

WISSMANN (*Klin. Monatsbl. f. Augenheilk.*, March, 1913) found a fungus in the tear duct, and concludes from his ob-

servations in this case and an extensive study of the literature that actinomycosis as a cause of tear sac infection is extremely rare.

M. W. J.

A Hitherto Undescribed Ophthalmoscopic Picture.

V. HIPPEL (*Klin. Monatsbl. f. Augenheilk.*, March, 1913) found this unusual condition in a patient suffering with progressive muscular atrophy. In the left eye to the temporal side and below the disc was a subretinal, cylindrical, protruding mass. Vessels emerged from the most prominent portion, but could not be followed to the papilla. The mass was partly gray, partly yellowish white, reddish or pigmented. On one side was a whitish green nodular cone. Areas resembling chorioretinitic processes were seen close to the mass. V. HippeL was unwilling to diagnosticate it as a sarcoma of the choroid or a calcified cysticercus.

M. W. J.

Dazzling Retinitis Following Observation of the Solar Eclipse on April 17, 1912.

BÖHM (*Klin. Monatsbl. f. Augenheilk.*, April, 1913) submits a detailed report on 412 cases observed at various continental clinics. Children who probably did not observe the eclipse as long or so intently as adults rarely complained of scotomata. The changes were mostly confined to the macular area. These are considered by most writers to be exudative processes. A relatively frequent complication (especially in older cases) was a marked pigmentation of the macular region. A small central scotoma is characteristic of sun dazzling. Myopic eyes are much less often involved.

M. W. J.

A Case of Peculiar Connective Tissue Strand Around the Papilla.

MASUDA (*Klin. Monatsbl. f. Augenheilk.*, April, 1913). The strand of whitish, opaque material surrounding the disc was found in front of the vessels. He suggests that it possibly represents the remains of some anomalous artery of the vitreous.

M. W. J.

A Contribution to the Relation of Infectious Diseases to the Eye.

RUSCHE, W., Bremen (*Zeitschr. f. Augenh.*, Vol. 30, Part 1; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, September 18, 1913), reports a case of scarlet fever complicated with marked

impairment of vision, due to optic neuritis. Treatment with mercurial inunctions and syr. ferri iod. resulted in a return to normal vision in each eye, but the temporal half of the nerves remained pale. Urine negative.

In the second case a severe iridocyclitis complicated a case of multiple joint swelling associated with high fever. In addition there occurred a transitory indurated, painful swelling of the lacrimal gland. Before death the inflammation subsided and the globe became phthisical. Paratyphoid-like bacilli were obtained from the blood of the patient, and streptococci from the knee joint. The writer is inclined to attribute the ocular changes to a mixed infection. A. C. S.

Contribution to the Question of Sympathetic Amblyopia. (Amblyopia sympathica maligna?)

PERLMANN (*Graefe's Archiv. f. Ophthalm.*, 84, 1, February, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, August 28, 1913) reports a case observed over a period of three years. The amblyopia of the uninjured eye which followed he designates as sympathetic amblyopia. This eye showed:

1. Irritability, lacrimation, photophobia, redness which disappeared after enucleation of the fellow eye.

2. Defective vision, fatigue symptoms, defective light and color sense, contracted field, sphincter paresis and paralysis of accommodation, which increased in severity after enucleation. A. C. S.

A Case of Contralateral Atrophy of the Optic Nerve Due to a Retrobulbar Sarcoma.

FEJER (*Centralbl. f. prakt. Augenheilk.*, October, 1912) reports a melanotic sarcoma of the right globe and orbit causing a considerable degree of pressure atrophy of the left nerve. Vision had sunk to faulty projection. After exenteration vision rose to 5/30, and a field of moderate size, smallest on the temporal side, gradually returned. M. W. J.

Concerning Chronic Inflammatory Tumor Formations in the Orbit.

MELLER, Vienna (*Graefe's Archiv. f. Ophthalm.*, 1913, Vol. 85, Part 1; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, August 7, 1913), studied nine cases, arriving at the following conclusions:

1. Every tumor of the orbit should suggest the possibility of a chronic inflammatory new growth, especially of syphilitic or tuberculous etiology.
 2. Therefore, Wassermann and tuberculin tests should always be made.
 3. Furthermore, the nose and accessory sinuses should be examined.
 4. These examinations having proved negative, treatment with mercury and iodids should, nevertheless, be begun.
 5. Having failed with this treatment, an exploratory excision is justified.
 6. Should the histologic examination prove the presence of a malignant growth, a radical operation is in order.
- He agrees with Goldzieher, that these new formations usually originate from a luetic periostitis.

A. C. S.

A Case of Thrombophlebitis of the Orbit Following Tear Sac Extirpation, With Consideration of the Pathologic-Anatomic Findings.

TAKASHIMA (*Klin. Monatsbl. f. Augenheilk.*, March, 1913) reports in considerable detail a case of orbital thrombophlebitis following the removal of a tear sac because of ulcer of the cornea. Takashima thinks that if removal of the tear sac can end so disastrously (his patient died within three days, of septicemia) it would be better perhaps to merely incise the sac, as is usually done in acute lacrimal abscess.

M. W. J.

Various Eye Injuries Caused by Fragments of Spectacle Lenses.

VOGT (*Centralbl. f. prakt. Augenheilk.*, December, 1912). In nearly 800 cases of eye injury five were due to splinters of spectacle glass and not to the force which first shattered the lens. The wounds were of the contused variety.

M. W. J.

The Etiology of Concomitant Convergent Strabismus.

SNELLEN, JR. (*Graefe's Archiv. f. Ophthal.*, 84, 3; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, October 16, 1913), attributes convergent concomitant strabismus to a unilateral or

bilateral abducens palsy. He questions the development of an amblyopia ex anopsia. The amblyopia complicating strabismus he ascribes to a partial atrophy of the nerve or retina.

A. C. S.

The Recognition of Cases of Genuine Chromatopsia.

HILBERT (*Klin. Monatsbl. f. Augenheilk.*, April, 1913) has gathered from the literature all cases of this kind reported since the appearance of his work on the subject in 1897.

M. W. J.

The Relationship Between Accommodation and Convergence.

ROELOFS, Amsterdam (*Graefe's Archiv. f. Ophthalm.*, 1913, Vol. 85, Part 1; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, August 21, 1913), studied the relationship between accommodation and convergence in his own eyes. He concludes that in any accommodation the same maximal divergence can be obtained by exercise and patience, and, vice versa, that in any divergence any accommodation is possible; furthermore, that the association between accommodation and convergence is the result of experience, and that in monocular vision with accommodation this relationship gradually becomes less intense. He also believes that conception of distance, whether the direct consequence of perceptions by the sense organs or by memory pictures of previous perceptions, can produce an innervation of both convergence and accommodation.

The usual anatomic position of rest is one of divergence. Orthophoria is the result of convergence innervation and is frequently found in emmetropes and ametropes possessing good binocular vision. It is the result of well developed association between accommodation and convergence innervation, and secondly, between distance conception and convergence innervation. In cases with poorly developed binocular vision, hyperopia predisposes to esophoria, myopia to exophoria or at times to esophoria.

Esophoria is the result of excessive accommodation aided by convergence, which is possible only after a certain degree of association between convergence and accommodation has been established. The absence of this association explains exophoria in myopes.

A. C. S.

The Intracranial Pressure in Some Ocular Affections.

HEINE, Kiel (*Muench. med. Woch.*, 1913, No. 24; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, September 11, 1913), after discussing the technic of lumbar puncture, reports his results in twenty-five cases of nystagmus. In seven he found normal intracranial pressure (up to 150), in seven a slight increase (up to 200), in nine a moderate rise (up to 300), and in two a marked increase of intracranial pressure (over 300).

Of the twenty-five cases nineteen were positively and two probably of congenital origin, pointing to a cerebral affection, with increased intracranial pressure and meningeal irritation as the primary factor. In fourteen out of nineteen congenital cases, intracranial pressure was above normal, also in three out of four acquired cases.

Slight pallor, usually temporal, of one or both discs, was observed in five cases, and attributed to disease of the cerebro-spinal system. Respecting the etiology, hereditary lues occurred in three, and in eight a history of acute febrile disease was elicited.

In six cases the gradual reduction of intracranial pressure acted favorably upon the general condition, the nystagmus and oblique head position.

In twenty-five cases of neurotic corneal disease (herpes corneæ, herpes zoster, keratitis dendritica, bullosa, neuro-paralytica, dystrophia epithelialis) increased intracranial pressure occurred in all but a few. Heine is inclined to consider these corneal affections also the result of increased intracranial pressure, and in a few cases observed excellent results after lumbar puncture.

A. C. S.

Salvarsan in Eye Practice (Concluding Article).

GORBUNOW (*Centralbl. f. praktische Augenheilk.*, April, 1913) reports on the results of salvarsan therapy in keratitis parenchymatosa, optic atrophy and paralysis of the oculomotor nerve. He believes that optic nerve atrophy is positively benefited by the use of salvarsan, that interstitial keratitis is favorably influenced, but that paralysis of central origin, as that of the oculomotor nerve, is not improved. This may be due to the fact that permanent changes have already taken place.

M. W. J.

A Case of Trochlearis-Paralysis During Typhoid.

KUMAGAI (*Centralbl. f. praktische Augenheilk.*, September, 1912) reports a case of paralysis of the trochlear nerve during an attack of typhoid. Patient made a complete recovery of the ocular condition. He thinks it was a peripheral neuritis, as there were no cerebral symptoms, the typhoid being of a mild type.

M. W. J.

How Can We Prevent Eserin Solutions From Turning Red?

WÖLFFELIN (*Klin. Monatsbl. f. Augenheilk.*, March, 1913) found that the reddish color of eserine sulphate or salicylate solutions, which appears soon after they are prepared, is due to alkaline substances in the glassware generally used. Light and air are minor but contributing factors. He suggests the use of tin vessels for stock solutions, which should always be made up in small quantities.

M. W. J.

Fibrolysin in Strictures of the Nasal Canal.

WOLFFBERG, Breslau (*Woch. f. Ther. u. Hyg. des Auges*, August 21, 1913), reports ten cases of dacryocystoblennorrhea treated with fibrolysin. The canals were impermeable to the finest probes until he instilled a few drops of fibrolysin (Merck). Daily treatments with this drug over a period of two weeks resulted in an apparent cure.

A. C. S.

The Nonoperative Treatment of Senile Cataract.

MEYER-STEINER, Jena (*Woch. f. Ther. u. Hyg. des Auges*, September 4, 1913), discusses the results of nonoperative treatment in thirteen patients, twenty-five eyes showing cataractous changes, the vision ranging from 5/6 to 5/60. Vision improved in twenty eyes, the improvement being both subjective and objective. Grayish opacities were more easily influenced than the sharply differentiated black opacities.

The treatment consisted in conjunctival instillations of weak solutions of sodium iodide, one-fourth to one-half per cent, combined with the internal administration of iodide (iodoglydine). In obstinate cases he ordered the daily instillation of a mixture of one-half per cent dionin and one-half per cent sodium iodide solution.

A. C. S.

The Intranasal Operation in Cases of Dacryostenosis.

WEST, Berlin (*Muench. med. Woch.*, 1913, No. 28; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, September 4, 1913), during the past year and a half operated on one hundred and nineteen cases from the Silex Clinic by the intranasal route, a method introduced by the writer in 1910, consisting then in a window resection of the nasolacrimal duct, but later changed to a window resection of the sac, thus establishing a direct artificial communication between the eye and the nose. The lower turbinates were left undisturbed. In ninety per cent of the cases the results were good.

The advantages of this method include:

1. Restoration of the physiologic function of the lacrimal canal, in addition to curing purulent dacryocystitis, lacrimal fistula or phlegmonous dacryocystitis.
2. Preservation of the lacrimal gland.
3. The avoidance of a skin incision with subsequent possible scar formation.

The operation is indicated in every affection due to dacryostenosis; it is contraindicated in very young children or in the aged. Polyaks' suggestion to give up entirely the use of probes does not meet with his approval. In strictures of the canaliculus and as a means of differentiating between tumors of the sac and tumors in the lacrimal sac region, probing will always prove its value.

A. C. S.

On Tarsus Excision in Senile Ectropion.

STANCULEANU, Bucharest (*Graefe's Archiv. f. Ophthal.*, Abst. in *Woch. f. Ther. u. Hyg. des Auges*, September 4, 1913), claims the advantages of this operation over the Kuhnt-Szymanowski operation consist in the uniformly excellent results, the absence of recurrences, the simplicity of the procedure, the brevity of the operation and of wound healing.

A. C. S.

Regarding the Technic of the Elliott Trephine Operation.

MENDE (*Klin. Monatsbl. f. Augenheilk.*, March, 1913) reiterates what he has previously said regarding the advantages of his modification of Elliott's operation. In view of the additional cases he has operated on since his last publica-

tion, he sees no reason for modifying his procedure, in spite of recent criticisms by Schnaudigal in this journal, i. e., *Klin. Monatsbl. f. Augenheilk.* M. W. J.

A Modified Elliott Trephine Operated by an Electromotor.

VOGT (*Klin. Monatsbl. f. Augenheilk.*, April, 1913) has devised an instrument resembling a dental drill, which permits an unobstructed view of the field of operation, and which does not produce a depression during the operation, as occurs with the ordinary Elliott trephine. Vogt's instrument does not have to be pressed down on the sclera, but requires the merest contact. Vogt thinks that by using his instrument the possibilities of injuring the iris and lens are diminished. M. W. J.

The Ophthalmoscopy of the Angle of the Anterior Chamber.

SALZMANN, Graz (Author's Abstract in *Woch. f. Ther. u. Hyg. des Auges*, October 16, page 25). When an eye with a deep anterior chamber is viewed from the side so that the cornea appears in profile, the iris becomes practically invisible because of the scleral border. If in this position light is thrown into the eye, the corneal profile appears as a white reflex because of the projecting distal scleral margin. When this reflex occurs it is a sign that the angle can be satisfactorily examined, in other words, the chamber is of sufficient depth. The angle is invisible when the depth of the chamber is less than one-fourth the radius of that curvature of the peripheral cornea through which alone the angle can be seen.

The direction in which the angle becomes visible is about at right angles to the axis of the eye. It therefore follows that the nasal half of the angle is most easily studied. Examination of other portions necessitates extreme positions of the eye and awkward positions on the part of the observer. Deeply situated eyes permit only examination of the nasal side.

The chief obstacle, however, is to be found in an insufficiency of depth of many anterior chambers. But by means of a Fick contact glass it is possible to artificially increase (by about 1 mm.) the optical depth of the chamber. In eyes with extremely shallow chambers even the Fick glass may prove inadequate.

The angle may be examined by either the direct or indirect

methods of ophthalmoscopy, the latter being the preferable method. Owing to the anterior position of the angle, however, the lens and the eye of the observer must be farther away than during examination of the fundus.

The ophthalmoscopic picture of a normal angle of an eye with a brown iris is made up of:

1. The anterior surface of the iris.—On account of the intense illumination it appears of a deep gold brown, almost orange yellow. Elevations and crypts are sharply differentiated.

2. The anterior surface of the ciliary body forming the bottom of the angle.—As a rule the entire extent of this surface is not visible because of the projecting ciliary border of the iris. Slight movements of the eye affect the extent of visibility. This surface has an even dull brown color. Its anterior (scleral) border is delicately fimbriated and sometimes gives off long, delicate, meridional processes. He regards these as the so-called iris processes, viz., the last offshoots from the anterior boundary layer of the iris proceeding over the base of the angle to the supporting framework. (Geruestwerk.)

3. The region of the supporting framework (the external wall of the angle) generally appears brilliant white with fine brown specks (probably stray chromatophores), more rarely with larger branched specks. The bottom of this zone is sometimes an even white, sometimes appears as a broader grayish line immediately in front of the ciliary body and adjoins anteriorly a narrower white line. The latter probably corresponds to the so-called anterior boundary ring of the supporting tissue, because when the iris processes appear especially numerous they extend to this white line. He was never able to see anything of Schlemm's canal.

4. The region of the corneoscleral junction.—Anteriorly (towards the cornea) the intensity of the light reflex gradually decreases. This probably corresponds to the oblique union of transparent cornea with opaque sclera.

In an eye with blue iris, the anterior surface of the ciliary body appears grayish brown, and its anterior margin is straight but not very sharp.

Pathology of the Angle.—He cites two cases with peripheral synechia.

Case 1.—Forty-six-year-old man with a history of rheumatic iritis extending over a period of twelve years. In the anterior portion of the supporting tissue is seen abnormal pigmentation, consisting of brownish black spots arranged in parallel rows. Peripheral synechiæ extend from the anterior surface of the iris to the margin of Descemet's membrane.

Case 2.—Sixty-one-year-old man with iridochoroiditis and marked atrophy of the iris. Complete peripheral synechiæ discernible with the aid of a Fick glass. White reflex not present and anterior surface of the ciliary body invisible. The iris appears as if cut off, terminating in a somewhat crooked line. The iris, probably because of atrophy of the vascular layers, appears dark, almost black.

Similar appearance presents itself in chronic glaucoma with peripheral synechiæ, but in most of these cases examination is very unsatisfactory.

In hydrophthalmos the appearance of the angle varies. Sometimes the angle is free, sometimes crossed by peripheral synechiæ, which exclude from view the anterior surface of the ciliary body. Even in the latter instance the reflex is present, because it is impossible for the periphery of the iris to completely cover the widened corneoscleral border.

This method therefore opens up to clinical investigation a portion of the eye which heretofore has only been submitted to anatomic investigation. A. C. S.

Yellow Coloration of the Macula in Vivo by a Yellow-blue Light Infiltrate.

VOGT, Aurau (*Graefe's Archiv. f. Ophthalm.*, 84, 2; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, October 16, 1913), employing the direct method of ophthalmoscopy and an illuminant consisting principally of yellow, green and blue rays obtained from an arc light by filtration, made the central portion of the macula and the lens appear yellow, and made demonstrable the finest details of the retina and the course of the nerve fibers. A. C. S.

Fragmentary Contributions to the History of Spectacles.

GREEFF (*Klin. Monatsbl. f. Augenheilk.*, April, 1913) describes spectacles made during the eighteenth century—for example, those having a joint in the nosepiece, permitting

variation in the width, and another kind which could be bent in the middle of the nosepiece so that the lenses could lie one above the other. In the latter the joint could be fixed by means of a hook. Another example was the scissors spectacles, used during the Directoire. The lenses were placed on arms diverging from a handle held at the level of the chin. These arms enclosed the nose like the blades of a scissors. A modification of the last form could be pushed backward into its case. These were called sliding spectacles (*schieber brille*). Wearing spectacles was extremely fashionable during the second half of the eighteenth century, and we find various oculists protesting against their unnecessary employment.

M. W. J. .

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

BY

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SAN FRANCISCO.

AND

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CINCINNATI.

Trauma of the Orbit and Brain by a Pistol Bullet, Quadrant Hemianopsia.

DE LAPERSONNE AND VELTER (Traumatisme de l'orbite et du crâne par balle de le revolver. Hemianopsie en quadrant. *Arch. d'Ophtalmologie*, Vol. XXXIII, April, 1913, p. 195) were fortunate to encounter a case of a pistol wound of the left orbit with extension into the brain, in which the patient survived the injury, so that both the patient's condition and the surroundings permitted them to obtain exact data. Many such injuries happen on the field of battle, but the patients either die, or the conditions are such that no clinic use can be made of the material, the notable exception being that of Tatsuji Inouye, who has reported four pertinent cases from the Russo-Japanese war, in two of which there was hemianopsia in the superior, and in the other two in the inferior quadrant.

In this case, a boy of fourteen years was shot in the left eye with a pistol of small caliber, the ball going straight through the orbit into the brain. On admission into the hospital his condition was:

A part of the ruptured left globe was visible through the lids, and there was a large hematoma into the left orbit. The right eye was normal in every way. With the X-ray the ball was located in the left occipital lobe, near the median line and the posterior superior wall of the skull. The nervous system

gave no localizing signs. Heavy torpor, no elevation of temperature, slow pulse. During the following days the stupor became more profound, all reflexes were abolished, and the right papilla showed hyperemia. On the third day 25 cc. of bloody serum were withdrawn through a lumbar puncture. Another puncture was made two days later, and a clear yellow fluid withdrawn. From this time on the patient improved, so that a week later the left stump could be enucleated under general anesthesia, and in three days the patient was up and around.

The most striking result of the examination, made sixteen days after the accident, was the marked intellectual clouding, with complete desorientation as to time and space. There was relative amnesia for facts antedating the accident, and complete amnesia for everything relating to the accident and the immediate past. No word deafness was present, but there was a certain amount of word blindness and psychic word blindness. There was no motor aphasia, but amnesic aphasia, a verbal visual amnesia. Improvement was rapid, and when the patient was examined two months later the mental confusion and desorientation had disappeared, but evocation amnesia was still present, as well as literal blindness for certain letters. The examination of the right eye, in which the vision was normal, revealed a quadrant hemianopsia, located in the temporosuperior part of the field. There was also a slight contraction of the other parts of the field. Later examinations showed no change in this condition.

The authors prefer late surgical intervention, except in those cases where wound infection declares itself, and lay great stress on the value of lumbar puncture, especially when made early, in all cases showing hypertension after head injuries.

M. W. F.

Unilateral Optic Atrophy After Compression of the Thorax.

LEROUX, H., Paris (Atrophie optique unilatérale consécutive à la compression du thorax, *Arch. d'Ophthalmologie*, Vol. XXXIII, April, 1913, p. 231). A miner was caught between a car and the side of the tunnel, receiving a diagonal compression of the thorax, but without the head or extremities being touched. Aside from the injuries to the thorax, the injured man, on regaining consciousness, was blind, and pre-

sented a diffuse ecchymotic infiltration of head and neck. Five days later the examination of the eyes showed large ecchymoses of lids and conjunctivæ in both eyes. Media and vision were normal in the left eye. The right pupil was moderately dilated, media clear, but the papilla was edematous; bloody suffusion of the lower part of the optic disc, and vision very poor. The left eye remained normal throughout, but optic atrophy followed the papillitis in the right eye, and vision was reduced to 2/10.

The occurrence of the ecchymoses in neck and face is explained by the sudden back-sweep of the blood in the vena cava superior; as this blood cannot find its way into the veins of the upper extremities on account of the valves, it rushes into the free jugulars. Wherever the pressure is higher, as in the eye, brain, and that part of the neck next to the collar, no ecchymoses occur. In the sheath of the optic nerve, however, conditions are different, and Leroux thinks that a hemorrhage into the optic sheath will explain all the subsequent phenomena. The sudden loss of vision can be attributed, with most likelihood, to a commotio retinæ; some authors think an ordinary hematoma may be held responsible, others an edema of the choroid.

M. W. F.

The Disinfection of the Hands Before Operations and in Daily Practice.

TERSON, M. A., Paris (La désinfection des mains de l'ophtalmologiste avant les opérations et dans la pratique quotidienne, Société française d'Ophtalm., May, 1913, *Arch. d'Ophtalm.*, Vol. XXXIII, July, 1913, p. 449), speaks of the disadvantage of wearing gloves, except in highly contagious cases, on account of the diminished operative dexterity. The hands cannot be made sterile by soap even after successive washings with alcohol and mercurial solutions. German military and civil surgeons have shown that washing the hands with concentrated alcohol without the previous use of soap will immobilize the bacteria and make them harmless for half an hour or more. Terson immerses the hands in at least 200 cc. of 90 per cent alcohol on a sandbath for at least five minutes, rubbing the hands. The same result may be obtained by wrapping the hands in compresses moistened with a solution of iodized alcohol, which should not be stronger than 1/1000.

M. W. F.

Subconjunctival Injections of Neosalvarsan.

DARIER, Paris (Injections sous-conjonctivales de néosalvarsan, Société française d'Ophthalm., May, 1913, *Arch. d'Ophthalm.*, Vol. XXXIII, July 1913, p. 429), found that in ten patients treated by the injection of a syringe of 1—100 under the conjunctiva there was apparent improvement in three cases only. Three cases of parenchymatous keratitis gave no result, one case of iritis with positive Wassermann was cured by a single injection, and one case of macular choroiditis with positive Wassermann was improved by a single injection. In one case of chorioretinitis with secondary cataract fourteen injections brought a considerable improvement in three months. Two cases of detached retina and one of iridochoroiditis were not influenced. Most of the patients refused a second injection on account of the severe pain.

M. W. F.

Optic Meningitides in Recent Syphilis.

LAPERSONNE, Paris (Méningites optiques dans la syphilis récente, *Arch. d'Ophthalmologie*, Vol. XXXIII, August, 1913, p. 465), recalls the division of optic neuritides into the early and late varieties; Groenouw has seen optic neuritis six weeks after the healing of the chancre, Soemiskiewisch in one to five months; Lapersonne in three, five and seven months. It is frequently unilateral, and may be accompanied by mucous or skin manifestations belonging to the stage called secondary. The clinical aspect is not characteristic, and the ophthalmoscopic picture does not enable one to make the diagnosis. In thirty cases of optic neuritis, in which syphilis was established as the etiologic factor, Smith found 14 papillitides, 17 neuroretinitides, and 3 retrobulbar neuritides. In the cases seen by Lapersonne edematous neuritis predominated, papillitis occurred once, but the slight papillary hyperemia mentioned by others was never seen. These neuritides may result in a complete cure, without leaving any change appreciable by the ophthalmoscope; generally, however, they result in a postneuritic atrophy, with white nerve head with irregular margins, pigment spots, and large veins, the loss of vision being in no proportion to the changes observed with the ophthalmoscope.

The precocity of the lesions, the variable prognosis, and the differences in the clinical aspects cannot be explained by

accepting a parenchymatous or interstitial neuritis as the cause; the sheaths of the optic nerve, especially the arachnoid, are primarily the seat of a cellular infiltration, which penetrates by means of the pia mater into the interfascicular spaces of the optic nerve, the fibers of which undergo secondary changes. Several years ago Marie and Léri tried to prove that in all cases of optic atrophy and blindness arising in the course of syphilis, especially in tabetics, the changes were due to chronic meningitis of the optic nerve. This notion is becoming general amongst the neurologists: that progressive syphilis of the nerves is always due to meningitis, whether it be tabes, general paralysis, meningomyelitis, or the sign of Argyll-Robertson, of ocular paresis, or transitory hemiplegia.

When the eyes are concerned the proof is furnished by the lymphocytosis of the cephalorhachidian fluid; ten years ago Lapersonne formulated the axiom that lymphocytosis is present in progressive syphilis of the retina and optic nerve, and disappears in the retrogressive stages. Widal has confirmed this by stating the lymphocytosis is the more intense the more recent the ocular or cuticular lesions are. Anatomic findings are necessarily rare, but Uthoff has been able to obtain them, and has found in one case "a very intense inflammatory reaction characterized by thickening of the pial sheath, by vascular neoplasms and a heavy cellular infiltration"; and in another, "the formation of intervaginal exudates and the production of a symphysis with a fibrous formation which almost entirely compressed the central vein." One can readily understand that this process can take place at different parts of the optic nerve, thus giving rise at one time to a retrobulbar neuritis, at another to an edema of the disc, and at still another to a papillitis. We can also understand the possibility of favorably influencing the process by beginning therapy before the cellular infiltration has reached the depths of the nerve and the interstitial processes have profoundly altered the optic fibers. Even before the function has become impaired one should act as rapidly as possible and establish the diagnosis by general examination, Wassermann test of both blood and cephalorhachidian fluid.

As to the therapy Lapersonne has a mild and an intense treatment. The mild treatment, which is used in regressive lesions, tabetic atrophies, old iridochoroiditis cases, etc., con-

sists in the injection of a cubic centimeter of bichlorid of mercury 0.10, sterile olive oil 10.00, every other day until twenty to thirty injections have been given. The injections are given in the gluteal region. Should the injections not be practicable, inunctions with 4 grammes of Neapolitan ointment (ung. hydrargyri) are made. Lapersonne has no faith in mercurials exhibited in pills or potions.

The intense treatment, which is called for in the greater number of cases of cerebral or ocular syphilis, consists in the intravenous injection of one cubic centimeter of cyanid of mercury 0.10, sterilized distilled water 10.00, every other day until twelve or fifteen injections have been made. This is followed, if the kidneys are normal, by intravenous injections of 0.25 to 0.35 of salvarsan, or 0.30 to 0.40 of neosalvarsan in 20 cc. of freshly prepared sterilized distilled water. Three or four of these injections are made with intervals of one week, and this, in turn, is followed by another series of twelve injections of the cyanid of mercury.

Should the case demand more energetic action, Lapersonne begins with the salvarsan injections and follows them with a series of a dozen injections of the cyanid, as he feels that it is by the association of these two drugs that one obtains the most rapid results. Arsenobenzol acts, as it does in the cutaneous lesions, very rapidly on iritis and certain forms of cycloiridian gumma.

M. W. F.

Conjunctival Melanosis.

BEAUVIEUX AND MURATET, Bordeaux (La m lanose conjonctivale, naevus pigmentaire de la conjonctive, *Arch. d'Ophthalmologic*, Vol. XXXIII, October, 1913, p. 620), having excised a large piece of conjunctiva from a woman aged thirty-nine years, subjected it to a very thorough microscopic examination, from which they make a number of interesting deductions. The pigment was most abundant near the basal membrane of the epithelium, growing less abundant toward the surface. The pigment is either free or included in epithelial or stellate cells, the pigment grains varying from dust to twenty-five to forty micra in the large masses formed by the fusion of several cells. The epithelial layer varies in thickness from thirty to one hundred and forty micra, the variations being due to surface inequalities, as the basal membrane

remains straight. Beneath the epithelium is a very lax tissue containing a large number of mastzellen and numerous vessels with very thin walls. This tissue does not, however, contain any inflammation products, lymphoid cells, plasma cells, nor isolated pigment cells. In the middle of this tissue is a cavity lined with epithelium, one-third of which is free, the other two-thirds being filled with pigment similar to the surface epithelium. Not far from this are two islands of epithelial cells, most of which are pigment free, but bearing between them strands bearing very small-grained pigment. The pigment varies in color from straw to India ink.

All elements of malignancy are wanting, and the name of pigmented nevus of the conjunctiva with underlying cyst seems appropriate. The hereditary character is evident, and it is fair to assume that there are certain cells in the conjunctiva which have the property of producing pigment, which are made active by certain forms of irritation, thus explaining the frequency of the melanosis in the lid opening. The authors decry the generally accepted idea that melanotic tumors are prone to great malignancy; of late a great number of operations on tumors of this class have shown no recurrence after many years.

M. W. F.

Morphologic Study of the Coagulation of the Aqueous Humor.

TERRIEN AND DANTRELLE, Paris (Étude morphologique sur la coagulation de l'humeur aqueuse, *Arch. d'Ophthalmologie*, Vol. XXXIII, October, 1913, p. 607). This article well deserves a careful reading, but does not lend itself well to an excerpt. The conclusions of the authors are that iridociliary vasodilatation constitutes the first phase, or the first step, in the mechanism of defense of the eye against traumatism, inasmuch as it makes possible the passage of blood plasma, fibrinogen, and of antibodies into the aqueous, thus protecting the eye against extraneous noxa, be they mechanical, chemical, or pathologic. It is by this means that the fibrous button is formed after wounds of the cornea, which show such a difference in their mode of healing from wounds of the sclera, the latter having no coagulative process of the vitreous to assist them. Besides the chemical and physical agents which determine the coagulability of the aqueous by the irritation which they set up, we have pathologic causes, such as the pres-

ence of a foreign body in the eye, which prolongs the coagulability over several months after its penetration, and tuberculous iritis. In both latter cases the coagulability of the aqueous might be used as a diagnostic help. M. W. F.

Thermotherapy in Progressive Ulcers of the Cornea.

WEEKERS, Liege (La thermothérapie des ulcères progressives de la cornée, *Arch. d'Ophthalmologie*, Vol. XXXIII, November, 1913, p. 681), has brought microscopic evidence to support his claim of the superiority of the use of hot air or vapor over the thermocautery in the treatment of progressive ulcers of the cornea. A section through a rabbit's eye immediately after cauterization shows the immense destruction of the corneal elements, especially of the corneal cells, with an extension into the neighborhood of the necrosing effect of the cauterization. The superficial epithelium is destroyed, the corneal lamellæ separated by a marked edema.

A section through another rabbit's cornea ten days after cauterization shows that the depression caused by the cautery has been filled by the proliferation of the superficial epithelium and, in a lesser measure, by the subepithelial infiltration; besides, one sees the membrane of Descemet pushed inwards by the proliferation of the overlying epithelium. This thickening of deep cellular layer is a constant phenomenon, and is one of the important factors in the ultimate production of opacities.

Another constant result of cauterization is the thinning of the corneal parenchyma, amounting in some cases to one-fourth of the original thickness, and thus predisposing to perforation and staphyloma.

The changes produced in the corneal tissues by the application of hot air are much less marked: immediately after the application there is an elevation of the epithelium and a slight edema of the subjacent layers of corneal parenchyma, but there is no destruction of tissue, and the thickness of the cornea remains unaltered. It is important, however, that the amount of heat applied be not excessive nor too frequently applied, as one may otherwise cause profound destruction. The opacification of the cornea is much less and the tendency towards clearing much greater. The nebulae that remain are due to the thickening of the superficial epithelium and the moderate infiltration of the subjacent corneal layers.

In 1912 Wessely demonstrated his heat treatment of corneal ulcers before the Heidelberg society. He used a vapor cautery, a small metallic tube in which a vapor of water or alcohol circulated (*Arch. d'Ophthal.*, 1913, p. 300), the temperatures used being respectively 98° and 78°. The results of the treatment are very gratifying; immediately after the application of the heat the pain vanishes and does not return, whereas after cauterization pains lasting for several hours are not uncommon, sometimes severe enough to necessitate the use of opiates. The ulcers heal much sooner after heat than after cautery, and the results as to vision are much more satisfactory, as shown by the following two tables:

After Cauterization. (Vasek, 67 cases.)		After Heat. (Weekers, 47 Cases.)	
Loss of eye.....	1	Loss of eye.....	0
Uncertain projection	2	Good projection	1
Good projection	0	Hand movements	1
Hand movements	16	Counting fingers	15
Counting fingers	30	5/60	13
5/50	3	5/36	10
5/30	5	5/18	4
5/20	1	5/12	2
5/10	1	5/9	1
5/6	1	M. W. F.	

A Simple Treatment for Dacryocystitis.

ZIMMER, Avignon (*Traitement simple de la dacrocystite. La Clinique Ophthal.*, July, 1913). After dilatation of the lower canaliculus, or splitting when necessary, the author introduces the canula of an Anel syringe as far as possible and washes with a warm oily solution. Following, he introduces a de Wecker grooved sound No. 1 which has been anointed with cocain and adrenalin salve, and allows this to remain in place for a quarter of an hour. Before withdrawing, a syringe of 10 per cent protargol paste is injected along the groove of the sound, which is then slowly removed. Refilling the syringe, and with a curved canula the sac is distended to the point that the paste comes through the superior lacrimal opening. The entire procedure uses about 1½ cc. of the paste. The patient must not eat for several hours fol-

lowing, and the treatment is renewed three days later. Two or three sittings in the course of a month usually suffice to cure the most obstinate case, and these results have endured over a year at the present time. J. S. W.

A Small Trial Case for Skiascopy.

BORDAS, Barcelona (Boite reduite de verres pour la skiascopie, *La Clinique Ophtal.*, July, 1913), mentions a great number of instruments used to facilitate retinoscopy. But the expense and inconvenience of placing the patient before the apparatus have limited their use. The author has a case made to place in the dark room containing eleven convex glasses and the like number of concave. The value of the lenses are as follows:

Concave (—)	{	10. D.	}	Convex (+)
		9.		
		8.		
		6.		
		5.		
		4.		
		1.		
		0.75		
		0.5		
		0.25		

and with these, combinations can be formed up to nineteen diopters, even in the quarters and halves, with the use of only two glasses. J. S. W.

Disinfection of the Trial Frame.

GALEZOWSKI (La disinfection des lunettes d'essai, *La Clinique Ophtal.*, July, 1913). The use of the frame without some precaution to prevent skin diseases of the nose and cheeks, conjunctivitis and lid conditions, is frequently done. The problem of sterilizing your frame after each patient is one of considerable magnitude, as it loses much time and destroys the metal. The author advises chloroform. He has a receptacle just the size of the frame filled with the fluid. In this he drops his trial frame after use. Withdraws it and places it upon a sterile gauze, when it dries rapidly through evaporation. A small quantity of ethyl alcohol added to the chloroform preserves the mixture. J. S. W.

Recurrences in Parenchymatous Keratitis.

FAGE, Amiens (Les récidives de la keratite parenchymateuse, *La Clinique Ophtal.*, July, 1913). wishes to draw a sharp distinction between relapses and recurrences. The latter are those cases which present the classical symptoms months or years after the other attack has been cured. Von Hippel had fifteen cases out of eighty-seven, or seventeen in one hundred. The author had exactly the same experience. The recurrences had exactly the same symptoms as the first attacks, divided into three periods, but less intensity. Neither the age of the patient nor the severity had any influence upon the recurrences. All treatments were tried with the best results from a combination of mercury and arsenic. The only effect of salvarsan was to improve the general health and thus aid in fighting off the disease. Time alone will prove if complete sterilization with arsenobenzol will control the subsequent attacks.

J. S. W.

T-Shaped Sclerotomy.

VAN LINT, Brussels (La sclerotomie en T, *La Clinique Ophtal.*, July, 1913). The technic consists in dissecting the upper half of the conjunctiva away from the limbus in its entirety to uncover the sclera as cleanly as possible. Two sutures are then passed at the angles from within, outward, so that when tied the flap will cover the upper pole of the cornea. The knife is then introduced in the sclera away from the limbus as in an antiglaucomatous iridectomy about 2 to 2.5 mm., the blade passing in front of the iris. This is followed by an iridectomy, or else an iridodialysis is produced. A radical incision with scissors is made, which extends from the middle of the first cut to about 1.5 mm. into the corneal tissue. The conjunctival flap is then drawn down to cover the wounds. The sutures are removed on the fifth day and pilocarpin is instilled for several weeks following.

Since 1912 van Lint has operated in this manner upon a dozen cases. All these cases have shown normal tension with tonometric readings, and results are better than follow a Lagrange or an Elliot. The chief danger in chronic glaucoma is that it takes almost four weeks for the tension to return to normal, and in these cases pilocarpin is necessary to prevent damage.

The advantages of this method over the sclerectomies are several, the chief being due to the conjunctival flap allowing the filtration of intraocular fluids to become diffuse; and the rapid closure of the wound. The sclerocorneal incision allows more ready filtration, which the author proves has continued fifteen days after the procedure. Two illustrations accompany the article.

J. S. W.

Remarks Upon the Nystagmus of Miners of the North of France.

DRANSART, Somain (Notes sur le nystagmus des mineurs dans le Nord de la France, *La Clinique Ophthal.*, July, August and September, 1913). This is a very long, continued article, which lends itself very poorly to abstracting, being very comprehensive in all details. Its object is to demonstrate—

(1) That miner's nystagmus is a muscular affection analogous to miner's lumbago.

(2) That there is no labyrinthine origin, or trouble of accommodation.

(3) That it is not a neurosis.

(4) That the condition occurring in North France is not a serious one.

The following subheads are now considered in a brief manner:—Clinical varieties, of which there are three: mild, severe, and moderate.

Functional troubles with nystagmus are photophobia, blepharospasm, muscular contractures of the face and neck, hemeralopia, amblyopia, asthenopia, paresis of accommodation, diplopia and many others.

There is a latent form of nystagmus recognized only with the ophthalmoscope, which, however, shows many of the functional complications.

Factors which influence the development of this condition are injuries to the cornea, any diminished resistance and excessive drinking and vice. The prime factor is the constant fixation upon objects above the horizontal median of the eye and the subsequent fatigue of the ocular muscles.

Frequently in North France about 12 to 20 per cent of all miners coming from work display this condition. In all there are about 15,000 workmen, of which number 13,800 have the mild or embryonic form. Those miners between thirty and forty years of age offer the maximum number, and after fifty-five years the disease is rare.

Etiology and pathology.—This condition is only noticed in those workmen who hold their body in one position and work above the horizontal plane of their eyes. This overstimulation causes the muscular fibrillations found in all physiologic experiments. The secondary factors are defective illumination, the blackness of the coal, paresis of accommodation, labyrinthine hyperesthesia, injuries, rheumatism, grippe and all intercurrent affections which debilitate. Three theories are mentioned to actually explain the pathology:

(1) Failure of proper stimulation to the retina because of the lack of illumination.

(2) Because of the muscular effort, the elevators are fatigued, especially the internus and externus of the right eye.

(3) The labyrinthine theory of Trombetta and Peters, due to the descent and ascent of the miners and the change of pressure in the eustachian tube, causing a hyperesthesia.

Theories Upon the Safety Lamps of Court and Thompson (August).—All things being equal, nystagmus is more pronounced in the pits illuminated by safety lamps than in those where the naked flame is used. This phenomenon can only be explained by anatomy and weakness to maintain the equilibrium of the eye through faulty illumination.

Influence of paralysis of accommodation and errors of refraction.—Both of these are secondary factors, as they make fixation difficult, contributing to the oscillations of the globe. However, this affection is met with in myopes, hypermetropes and ametropes, so no definite conclusion can be drawn.

Blackness of the coal.—It has been demonstrated that individuals placed 30 centimeters from a plane of various colors, the eye fixing in a horizontal direction, give the following results:

Black or green	Immediate nystagmus
Blue and violet	Nystagmus in three seconds
Red.....	Nystagmus in four seconds
Pale yellow.....	Nystagmus in thirty-seven seconds
White.....	Nystagmus in forty seconds

The predisposing cause of miner's nystagmus is to be found in a congenital or acquired weakness of the extrinsic ocular muscles, usually the internal recti, and this reveals why only 30 per cent of the men working under the same conditions

suffer from the disease. Faulty fusion sense has been demonstrated, and long after the nystagmus has cleared up in miners who have changed their occupation, the weakness of the right interni is always present.

The pathologic physiology can be explained solely by the myopathic theory, as neither a nervous, bulbar nor cerebral causation can exist, as we know that the nystagmus always resolves, leaving no trace except the weakness of the interni or externi muscles.

Conclusion (September).—The medicolegal aspect of the condition shows:

(1) All injuries to the skull and eyes intensify the nystagmus.

(2) During the height of the nystagmus vision is diminished 50%.

(3) Since pensions have been given, attempts at simulation have been made, but with no success.

(4) It must be borne in mind that because of diminution of vision nystagmus is likely to cause accidents not alone to the sufferer but to his fellow workmen.

The treatment may be divided into prophylaxis and curative. Under the former head must be considered the lamp which will give the maximum diffused light, as this only will prevent the accidents which increase the intensity of the oscillations.

The curative treatment, because of the origin, is directed toward two principal indications:

(1) Rest of the excited muscles by cessation from work.

(2) Toning up the overworked muscles.

According to Ohm it may be advisable to advance the right internus, but this is only feasible in very severe cases.

F. W.

The Influence of Antidiphtheritic Serum Upon the Evolution of Ocular Infections.

DARIER (De l'influence du Serum Antidiphtherique sur l'evolution des infections oculaires, *La Clinique Ophthal.*, August, 1913) takes issue with the long article published from Axenfeld's clinic, which, after considerable animal experimentation, states that the method of Darier is absolutely unreliable and should be abandoned. The author states that he never intended the serum treatment to take the place of local

remedies, but uses it merely to build up the tissues and increase the body resistant power, as it has no bactericidal or anti-toxic value. The method of giving the serum per os does not interfere with the local eye treatment. His method in severe corneal ulcerations is to give 2500 units of antidiphtheritic serum by mouth, use dionin for the lymphogogic value, then subconjunctival injections of NaCl., Hg. Cyan., etc. If these fail, in order, caustics, either chemical or galvanic, then conjunctival flaps and lastly paracentesis of the cornea or a Saemisch section.

The best effects of the serum are seen in hypopyon iritis, but paraspecific serotherapy will no more cure all ocular infections than specific sera all specific diseases. J. S. W.

Ocular Tuberculosis.

ABADIE (De la tuberculose oculaire, read before la Société française de Ophtalmologie, May 7, 1913, *La Clinique Ophtal.*, August, 1913). The eye being the only organ in the body which can be constantly under visual control, is especially important in the study of tuberculosis. From experiments, ocular tuberculosis is now shown to be generally primary and not secondary, as was heretofore supposed. The author has had great success with the medical treatment. The chief point to bear in mind is that progress will be very slow and that discouragement and change of therapy is fatal to the cure. Six to eight months elapse before any amelioration is noted. Iodid is fatal to the Koch bacillus, and upon this the therapy is based. Twenty to forty drops of iodogenol (a trade preparation of organic nature) is given after meals over a period of one year. In addition cod liver oil is rubbed in daily over various parts of the body. The following combination is used:

Cod liver oil.....	200.0
Guaiacol	15.0
Essence of citronella	4.0

He then presented three cases which he had cured. The first, a fourteen-year-old girl, after suffering for three years, showed infiltrated cornea, posterior synechia, cloudy vitreous and only light perception. She was given twenty drops of iodogenol each day, together with frictions of the above prescription and 60 grams of raw meat. After eight months vision

is $1/4$ and $1/6$. This case could not tolerate potassium iodid, but did beautifully under a peptone of iodin.

The second case, one of chronic dacryocystitis, which did not respond to the treatment. Nasal examination revealed lupus ulcers with enlarged cervical glands. Treatment taken for four years and patient has now been free from all trouble for a long time.

He also reports a case of lupus in a girl of twelve years which resolved. He presented a woman who had been declared incurably blind by three oculists, following an injury with a feather and subsequent keratitis, which the author diagnosticated as ocular tuberculosis of traumatic origin. This patient today is in possession of fair vision, comes alone from her home and is already able to read. J. S. W.

Seven Cases of Gonorrheal Conjunctivitis Treated With a Vaccine From the Pasteur Institute of Tunis.

CUENOD AND PENFL (Sept cas de conjonctivite à gonocoque traites par un vaccin de l'Institut Pasteur de Tunis, *La Clinique Ophthal.*, August, 1913) describe their observations to prove that vaccine therapy is a valuable aid in this condition. All their cases were authentic and bacteriologically examined in the Pasteur Instituté. The injections were intravenous at the bend of the elbow, except in the newborn, when they were subcutaneous. They were followed in an hour by a chill, and then considerable temperature (103 degrees), but of short duration, so that the following day there were no general symptoms. It usually took three to four injections, although in a single case one sufficed. The cases are then described in detail with very satisfactory results. J. S. W.

Spread of a Nasal Diphtheria Through the Lacrimal Passages.

HAAS (Propagation lacrymale d'une diphterie nasale, *La Clinique Ophthal.*, August, 1913) relates the history of a most atypical case. A boy five years of age had a most pronounced edema of the left eyelids, with a mild grayish discharge. The preauricular glands and submaxillary were enlarged. Patient had scarlet fever eighteen months before. A pseudomembrane found in nose which was diphtheritic in character. No membrane on the conjunctiva and no bulbar injection. Antitoxin was administered, and subsequently large quantities of albu-

min were found in the urine, which had not been examined before. Boy died five days after, but before, all the edema and glandular swelling had disappeared. The author explains the case by supposing that the albuminuria followed the scarlet fever, making the patient more susceptible to the diphtheria which infected the left nasal fossa. This was a very attenuated bacterial strain and spread up the lacrimal duct and caused the local symptoms, which could not have been the result of toxins, because of the unilateral character and the adenitis. The rapid action of the antitoxin makes the diagnosis more certain.

J. S. W.

ABSTRACTS FROM SPANISH OPHTHALMIC LITERATURE.

BY

WILLIAM H. CRISP, M. D., OPH. D. (COLO.),

DENVER.

Glaucoma in Hot Countries.

LOBO, MANUEL N., Bogota, Colombia (*Anales de Oftalmologia*, June, 1913). From his observations in Central America the author states that inflammatory glaucoma is very common in hot countries. It occurs from the age of twenty-five years, with equal frequency in both sexes in earlier life, but more frequently in women after the fiftieth year. The lens rapidly becomes opaque. Arteriosclerosis, affections of the heart, alcoholism and malaria do not appear to play an important part in its etiology. Glaucoma is very frequent in individuals who by their occupation are exposed to great heat. Both hardening of the lens and presbyopia are premature in hot countries. The author explains the frequency of glaucoma in the equatorial zone as due to rapid swelling of the sclerosing lens, with resulting shallowness of the anterior chamber, hypertrophy of the ciliary processes, and obstruction of the canal of Schlemm.

Case of Encysted Mucocoele of the Lacrimal Sac.

CAMPOS, EDILBERTO, Rio de Janeiro (*Anales de Oftalmologia*, XV, p. 457, June, 1913). A subconjunctival swelling had existed for seventeen years in the region of the left lacrimal sac, although there had never been any inflammation or suppuration. On removal the cyst failed to show any abnormal connection with the nasal cavity, but the author suggests the possibility that an anatomic deformity of the nasal septum which was present was due to the long continued presence of the cyst.

Operative Cure of Myopia.

PÉREZ BUFILL, Barcelona (*Archivos de Oftalmología*, July, 1913). Three cases are reported. The previously existing myopia was respectively 16, 16, and 18 D. Discussion was repeated at quite frequent intervals, and in each case the lens remains were finally extracted through a linear incision. The previous vision was respectively 5/36, 1/4, and 1/6, and the final vision obtained was 5/24, 1/4, and 1/3. The operative history of the first case was complicated by iritis with resulting permanent synechiæ, and an iridectomy was necessary to arrive at the visual result stated. It is strange that not only did the author observe no astigmatism in either case before operation, but in spite of the linear incision neither case (it is stated) showed any astigmatism at the final correction.

Retrobulbar Optic Neuritis and Paresis of the Sixth Cranial Pair, Following Diphtheria.

GARCIA DEL MAZO, JOSE, Madrid (*Archivos de Oftalmología*, July, 1913). A girl of nine years, who had promptly recovered from severe diphtheria after the use of serum, had an early paralysis of the velum palati which disappeared in a few days. After several weeks she complained of indistinct vision. A month after the attack of diphtheria her visual acuity was found to be: Right 1/8, left 1/6. The visual field was contracted. Two weeks later there was an improvement in the vision, but the child complained of diplopia, which was found to be due to paralysis of both abducens nerves. Ten weeks after her original illness the diplopia had disappeared and vision was normal.

Xerophthalmus and Symblepharon of the Right Eye.

DEHOGUES, JORGE L., Havana (*Archivos de Oftalmología*, July, 1913). The conjunctiva had lost its mucous aspect and taken on that of the skin. The cornea had also lost its transparency and was covered with squamous epithelium. The appearance was as though the corneal epithelium were covered by a gray membrane. There was complete symblepharon of both lids, the movements of the globe being limited to a lateral excursion of about ten degrees. The lacrimal secretion was abolished. There was chronic dacryocystitis. Vision

was shadows. The cornea was swept by the eyelashes. The condition dated back eighteen years, and the patient was unable to give any information as to the original disturbance.

Bilateral Iritis From Hereditary Syphilis.

GARCIA MANSILLA, D. SINFORIANO, Madrid (*Archivos de Oftalmologia*, July, 1913). A plastic iritis developed in the right eye of a girl of fourteen years. There were stigmata of hereditary syphilis. The use of atropin and intramuscular injections of biniodid of mercury was followed in four weeks by complete cure. Three months later the left eye presented the same condition, but with greater intensity. It yielded completely to the like treatment in twenty days.

A Case of Traumatic Enophthalmus.

LUTZ, ANTON, Havana (*Anales de Oftalmologia*, August, 1913). A year previously the patient had been thrown from a coach, receiving injuries in the neighborhood of the left eye. At the time of examination this eye was enophthalmic fourteen millimeters, and was turned upward and outward. The eye could be moved only slightly upward and outward, and not at all downward. Passive movements under cocain revealed marked resistance, especially to movement downward, and gave a sensation of loss of elasticity in the tissues back of the globe. There were several cicatrices in the upper lid and in the superior conjunctival fornix. Radiograms demonstrated a fracture of the frontal process of the superior maxilla, and a decalcification of the upper orbital rim. The orbital cavity was not increased. The ocular media and fundus were normal, and vision of 4/9 was obtained by holding the upper lid out of the way and inclining the patient's head. Temporary division of all the recti muscles did not make possible free movement of the eye in any direction; from which the writer deduces that there must have been cicatricial contraction in the posterior part of the orbital cavity. Persistent use of fibrolysin produced no improvement.

ABSTRACTS FROM SCANDINAVIAN OPHTHALMIC LITERATURE.

BY

WILLIAM H. CRISP, M. D., OPH. D. (COLO.),

DENVER.

Cataract and Internal Secretion.

SCHJÖTZ, CARL, Christiania (*Norsk Magazin for Laegevidenskaben*, 74, p. 1201). The paper begins with the discussion of a case of cretinism in a calf, accompanied by cataract. The animal was born in the goiter-cretinism district of Kongsberg in Norway. The veterinarian of the district stated that he had frequently found cataract with goiter in calves. Vossius has recorded twenty-nine cases of cataract in women with goiter. Usually this human cataract did not involve the whole lens, but rather the central part; and in eight eyes from strumous calves, Schjötz found the cataractous changes to be located also in the center of the lens.

The rest of the paper consists of a review of the literature bearing upon the relation between cataract and disturbances of internal secretion. Various authors have reported the occurrence of cataract in association with a lowered activity of the parathyroid gland, of the pancreas, or of the sexual glands. Others again have noted lens opacities in connection with hypersecretion of those glands whose activity is commonly regarded as balancing that of the first group, viz., the suprarenals, the thyroid, and the hypophysis. If deficiency in internal secretion from the sexual glands favors cataract development, women, whose sexual activity ceases at a much earlier age than that of men, should show a preponderance in cataract statistics. The writer presents some figures from a public clinic and from a private practice which seem to show such a preponderance. Chvostek has demonstrated that failure of the ovarian function causes an increase of cholesterin in the blood. According to Laqueur, cholesterin crystals may

constitute the only opacities in the lens. Von Büнау has reported, from a statistic of ten years at the Halle clinic, that 10.6 per cent of the patients with senile cataract had had typhoid fever. The general character of this disease points to its having a profound influence on the internal secretions, and it causes acid intoxication. Poisoning with adrenalin can produce tetany, and this condition is known as a factor in the causation of cataract.

The writer urges that special attention should be paid to the condition of the parathyroid glands at autopsy; and also to the question of the concurrence of cataract with parathyroid insufficiency.

Pathogenesis of Myopia, With Statistics of Refraction After Twenty-five Years of Age.

BJERRUM, J., Copenhagen (*Hospitalstidende*, Nos. 23-24, 1913). Tscherning's studies in the incidence of myopia indicated that whereas the more usual lighter grades of myopia were found almost solely in persons who were close readers, excessive degrees (above nine diopters) were about equally frequent in readers and nonreaders. But Bjerrum's statistics of patients above twenty-five years of age show a greater incidence of high myopia in readers than in nonreaders. The author adds a personal theory to the many already published concerning the causation of myopia. He believes that the great amount of brain work which accompanies reading, rather than outdoor work or distant use of the eyes, may cause the formation of metabolic products which, with the stooping position in reading, affect the back part of the eye in such a way as to lead to chronic disturbance of nutrition with lessened resistance to intraocular pressure.

ABSTRACTS FROM ITALIAN OPHTHALMIC LITERATURE.

BY

J. HERBERT CLAIBORNE, M. D.,

NEW YORK.

On Wounds of the Ciliary Body.—A Clinical and Pathologic Study.

CONTINO, A. (*La Clinica Oculistica*, July and August, 1913, di Roma). The article opens with reference to the work of Mackenzie, who was the first to demonstrate the importance of sympathetic diseases of the eye, and that in the majority of cases it is due to wounds of the ciliary region. It also refers to the work of de Wecker and Mooren, Hansen and Daub, Ivert, Baudry, Praun and Wagenmann. His object in writing the paper is to treat as fully as possible penetrating wounds of the ciliary region, and discuss the questions which arise from their consideration.

He gives a description of the various forms of wounds, in regard to their location, the degree of penetration and character of the wounds produced by different objects; likewise rupture, direct and indirect, of this region. He reports thirty-four cases in detail, with the clinical history from beginning to end, and in many cases the pathologic findings. A large number of excellent cuts illustrating the results upon the eyeball are both instructive and interesting.

In the September, October and November number the article is continued with a dissertation on the establishment of the diagnosis, particularly with reference to the degree of penetration of the ciliary region, and to that end he counsels the careful use of the ophthalmoscope when possible. There is a tabulated statement in this issue showing the sympathetic reaction in a number of cases, both lacerated and bruised wounds of the ciliary region, and those in which the foreign body penetrated. This tabulation is interesting, important

and instructive. He regards the prognosis in all cases as grave, especially when the patient is affected by catarrh of the conjunctiva or the lacrimal duct, or when there is any constitutional ailment or feeble power of resistance in the tissues. In the matter of treatment he refers to the use of scleral sutures in order to cut off, if possible, the entrance of microbes into the interior of the eye; likewise the stitching of the conjunctiva over the wound, and cites the procedures of a number of observers along these lines, amongst which are mentioned the cauterization of the margin of the wound immediately after the abscission of any part which may project; likewise the subconjunctival injection of sublimate and other remedies. He considers the mercury cure effective only when there is no penetration of the foreign body. When, however, purulent infection has taken place, it only remains to perform exenteration of the eyeball in order to free the patient from useless suffering. The author does not treat the removal of magnetic foreign bodies by the magnet, which, indeed, may be considered another chapter to this subject.

The paper is quite long and thorough, from a clinical and pathologic standpoint, but the author fails to draw any deductions from his observations, and the paper in general lends itself badly to condensation. It is worth anyone's while to read it, but deep study would be necessary to draw any conclusions from it. The cases related are like those that have already been described. In many cases there was recovery with good sight, in some there was atrophy of the injured eyeball, and in others there was sympathetic ophthalmia.

It is regrettable the author did not see fit to concentrate his views on the subject in the shape of conclusions. The paper reminds one of a dinner composed of excellent articles of diet well cooked but badly arranged, with the consequent feeling of dissatisfaction after the repast.

SOCIETY PROCEEDINGS.

BY

ARTHUR J. BEDELL, M. D.,

ALBANY.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

Meeting of October 20, 1913. Dr. Willis O. Nance presiding.

Sporotrichosis of the Conjunctiva.

Dr. W. H. Wilder: C. P. M., a student, working in a laboratory with cultures of various strains of sporothrix, had on several occasions broken, ten inches from his face, small capillary pipettes containing emulsion of the organism.

July 10th, 1913, in the evening, he noticed soreness of both eyes with photophobia and a foreign body sensation under the lids. The following morning the lids slightly swollen, pain increased and the surrounding lymph glands quite tender. July 11th, the general condition good, leucocytes 9000. The pain, swelling of the eyelids and photophobia increased. The conjunctiva of all eyelids reddened and so swollen that the fornix rolled out in a mass when the lower lids were everted. On the palpebral conjunctiva and also on the top of the fornices were several grayish yellow, slightly elevated spots, varying in size from 0.5 mm. to 2 mm. in diameter, which seemed like small yellow ulcers, the epithelium having been cast off. There were numerous follicles in other portions of the conjunctiva. The secretion was scanty; a smear made from gentle scraping over the spots and conjunctiva, stained with alkaline methylblue, showed no organisms, but numerous pus cells. The next day aerobic and anaerobic cultures were made from scrapings of the shallow ulcers. Potassium iodid, ten grains three times daily. The eyes were

washed out several times daily with a solution of oxycyanid of mercury, 1-4000. July 16th, the condition not improved. The preauricular glands were swollen, increased tenderness. Oxycyanid reduced to 1-6000 because of irritation. No growth in the tubes, which were placed at room temperatures (18 to 20 degrees C.). July 17th, the condition of the lids was no better, more yellowish spots forming in the conjunctiva. The patient seemed sick, with a temperature of 100.5° F. The preauricular, anterior cervical, submaxillary and postauricular glands were swollen and painful. The small ulcerated spots on the conjunctiva were treated with tincture of iodine. July 18th, the general condition was worse; headache; malaise; temperature, 101 degrees; leucocytes, 18,000. Sporothrix growing in the tubes, and spores found in the scrapings from the conjunctiva. July 19th, general condition worse and patient went to bed. Temperature 102 degrees; leucocytes, 14,600. During the night had a sudden pain in the left knee; in the morning the knee was very sore and tender. No swelling or redness. An ice bag for twelve hours relieved the pain. The swelling of the conjunctiva was somewhat less, and no new spots had appeared. Iodid increased to 20 grains three times daily. July 20th, the temperature 99 degrees in the morning; rose gradually to 101.4 degrees in the afternoon. The ulcers in the conjunctiva healing. July 21st, in the morning, pain in the left elbow, wrist and lower end of the right femur; very sharp, especially on motion or pressure; temperature 100.6 degrees in the afternoon. July 22d, pains still persistent; temperature 101 degrees in the afternoon; conjunctiva much improved; ulcers healed. July 23d, in the morning no pain except in the left wrist. During the night severe pain in the right knee and right ankle. Temperature 100.3 degrees in the afternoon; leucocytes, 11,200. July 24th, no pain. Temperature 99.4 degrees. The conjunctiva still red, and the fornices considerably swollen. From this time on the temperature and leucocytes remained normal. The swelling of the glands disappeared, but the subconjunctival tissue of the fornices remained swollen for some days. In about two months the lids were normal.

After giving a detailed report of the microscopic examination and cultures, Dr. Wilder stated that, from a study of the cases that had been recorded and of the one he has observed,

he should say that infection of the conjunctiva by sporothrix causes a marked congestion of the membrane, particularly the palpebral portion, the fornix and semilunar folds. The bulbar portion less affected. Numerous follicular prominences appear in the palpebral conjunctiva and the fornix. Small, yellowish nodules, varying in size and shape, develop rapidly in the conjunctiva, and these may ulcerate. When opened, the contents of the nodule does not escape rapidly, as from small abscesses, but seems to be of a gummy consistence. These little nodules developed so rapidly in this case that new ones presented the second day. Secretion scanty, but lacrimation abundant. The eyelids somewhat edematous and thickened. Palpation shows a well marked induration of the subcutaneous tissue with enlarged and tender neighboring lymph glands. Subjectively there is a sensation of a foreign substance under the lids, and so much discomfort that use of the eyes is almost impossible. This discomfort comes on rapidly after the infection. The two cases of laboratory infection (that of Fava and the present one) and the absence of a history or trauma in the other cases, seem to show that the sporothrix is able to penetrate the normal conjunctiva. It also appears from the reports of cases that infection of the eye may be secondary to a generalized sporotrichosis. Probably in most cases the infection is ectogenous, but the suspicion that it may be endogenous is aroused by the case of Lapersonne, in which, after a violent iridocyclitis and perforation of the eyeball, sporothrix was obtained from the contents of the bulb. That general symptoms may arise from a primary lesion of the eye is indicated in this case by the fever, leucocytosis and pains in the bones of the extremities.

Differential diagnosis.—Lymphadenopathy would be present in chancre of the conjunctiva; multiple erosions or ulcerations are unusual. The scrapings from such an ulcer would probably show the characteristic spirochete. Tuberculosis of the conjunctiva would probably not be so rapid in its course, and it would be a week or more before the caseous tuberculous nodules would break down and form the ulcer, whereas in sporotrichosis the small ulcers develop in a few days.

Parinaud's conjunctivitis presents more points of similarity, and it is possible, as mentioned by Morax, that cases of

sporotrichosis may have been mistaken for Parinaud's conjunctivitis.

Discussion.—Dr. C. P. McCullough stated that the diagnosis of the organism bacteriologically is comparatively easy. Scrapings were first taken from the eye and inoculated on various kinds of media, aerobic and anaerobic, but the latter cultures showed no organisms. At the end of seventy-two to eighty-four hours there were slight colonies, which appeared on one per cent dextrose agar media. These appeared as slightly raised, grayish white, elevated, peak-like, with corrugated surfaces. The three original culture tubes showed the characteristics of the organism. Microscopically Gram positive stain best. At the end of forty-eight hours there were filamentous growths in the shape of conidia. At the end of three or four days' growth the microscopic appearance is practically that of conidia, very little of the filament being seen. Bacteriologic tests were made of the organism, tested from an immunologic standpoint. The agglutination reaction, as well as the opsonic index, was gradually increasing each day.

Experiments were tried to see whether or not various strains of the organisms could be identified. In the work with the sporothrix he has been using five different strains, four strains isolated in this country and one isolated in France, and it was found that they could not identify the organism from a bacteriologic or cultural standpoint, so that immunologic tests were tried, and there was no difference between the types of the organisms.

Dr. Ludwig Hektoen reported the case of a boy who lived in Iowa. The boy hit his index finger with a hammer and there developed various subcutaneous nodules. It was from the pus of these nodules that the sporothrix *Schenkii* was isolated. Since that time about fifty to sixty cases of this disease have been described in America. The majority of cases have occurred in the Missouri valley. There seems to be some condition peculiar to that valley which favors the development of this organism, which is supposed to grow on grasses or vegetables, although it is not known exactly how infection occurs in nature. There is only one case reported of contact infection. Dr. Hektoen showed slides illustrating the later phases of the disease. It was the chronic course of

the infection that led Schenk, when he described the first case, to describe it as a case of refractory subcutaneous abscesses which eventually healed perfectly. The disease can be readily reproduced in white rats and white mice. By means of a slide he showed the body of a white rat inoculated intraperitoneally; the scattered whitish nodules had developed. These nodules contained pus in which were the spores. It is difficult to demonstrate conclusively the presence of spores in the pus from human cases, but they resemble very much fragments from leucocytes and other nuclear detritus, but in some of the smears from the eyes of the patient whose case was reported by Dr. Wilder he thought the spores could be seen, but he was not absolutely sure about it. The same disease caused by the sporothrix develops in the horse and gives rise to subcutaneous nodules the same as those that occur in the disease in man.

It is interesting to note that twenty-two of the American cases of sporotrichosis have been described as having occurred in North Dakota. Some of these cases were described originally as tuberculous ulcers of the skin.

The Relation of Increased Intraocular Tension to Acute or Chronic Accessory Sinus Disease.

Dr. Henry Manning Fish stated that increased intraocular tension and various ocular symptoms suggesting glaucoma, appearing in connection with disease of the nasal accessory sinuses, have been reported by Quagline, Lennox Browne, Cozzoline, Berger, Ayers, Ziem and others. The author in 1907 reported two cases of primary glaucoma and one of secondary glaucoma, in which marked amelioration of the symptoms resulted after drainage of the sinuses, with improved vision and increase in the size of the visual field.

Several cases with glaucomatous symptoms, some of which showed marked improvement following treatment of the sinuses, are included in the author's paper.

Discussion.—Dr. Oliver Tydings has had such cases: one in his office last week, of increased intraocular tension on account of a sinus condition.

Osteoma of the Orbital Cavity.

Dr. Oliver Tydings reported a case in which he removed a vascular bony tumor from the orbital cavity.

Oxalic Acid Burn of the Eyeball.

Dr. George F. Suker reported the case of a woman who had divergent concomitant strabismus, on whom he did advancement and shortening in one eye. Vision in each eye was 20-20. He went through the usual procedures in this case. The cornea began to be hazy, and he thought the excessive use of cocain may have caused the condition of the cornea. He suggested to the interne that lie thoroughly flush out the eye with boric acid and wait a moment or two, close the lid and open it. On reopening the lid he dropped in more of the solution, and in the meantime the cornea became quite white, the patient could only count fingers at one foot. He subsequently found that a mistake had been made in solutions. The line of treatment was the instillation of warm olive oil, a warm compress and irrigations every ten or fifteen minutes. She left the operating room able to count fingers at one foot and the cornea practically opaque, with very little swelling, but intense pain. From that time the cornea cleared up, and in the space of about two weeks vision was 20-20. The burn corresponded with one produced by carbolic acid. A mistake had been made in handing him the oxalic acid solution. In the same connection he spoke of a sulphuric acid burn as the result of a golf-ball explosion.

Discussion.—Dr. Wilder asked what make of golf-ball contained sulphuric acid.

Dr. Suker replied water cores.

Dr. Wilder said that these were not made any more or were not used. The old colonel did not contain sulphuric acid. He did not see how any golf-ball could contain sufficient acid of caustic strength and be serviceable as a golf-ball.

Dr. Frank Carroll said that he had confirmation of the fact that golf-balls contain sulphuric acid. A little patient of his, a boy, was whittling a golf-ball down to get the rubber bouncer inside until he reached the center, and then some juice spurted in his eye. The eye was saved, but examination of the contents of the ball showed that it contained a weak solution of sulphuric acid.

Dr. Willis O. Nance saw the case Dr. Suker had reported about twelve or fifteen minutes ago. It was the first he had heard of or seen. The last analysis he had seen reported in

ophthalmic literature was that the contents of these balls were a combination of chlorid of lime and soap. He did not know they contained sulphuric acid. He could hardly see how a solution of sulphuric acid strong enough to do any damage could be contained in the rubber container. He had seen two or three cases since that time.

Dr. H. B. Young, Burlington, Iowa, said that a nurse had used oxalic acid instead of boric acid in the eye of a newborn babe.

Dr. Nance saw a case of oxalic burn of the eye two years ago. The eye of a trained nurse in one of the hospitals of Chicago was irrigated with a solution of supposedly boric acid. Immediately following the irrigation there was considerable pain and the mistake discovered. The eye was immediately irrigated with boric acid. Other than a conjunctivitis which persisted for four or five days, no ill result followed the accident.

Dr. A. L. Adams, of Jacksonville, reported another case of golf-ball accident. While standing by watching two boys open a golf-ball, some fluid spurted into a child's eye. He was brought to the hospital. A whitish scar was found extending to the corner of the inner canthus, but not involving the cornea. The eye was washed with boric acid solution and healed in a few days.

Dr. Willis O. Nance urged the society to have an examination made of the contents of the fluid in core golf-balls.

Dr. E. J. Gardinier said the golf association has issued a warning about these balls and he thought their use would be discontinued.

Dr. William H. Wilder said the manufacturers of the colonel ball, which was a core ball, had discontinued making it because of the many reported accidents. One type of ball had been found to contain a paste made of chlorid of zinc and soap. The public should be warned that injuries were likely to follow breaking of the ball. He suggested that the society take some action upon the matter and send out as a society a note of warning, calling the attention of the public to the injurious effects of such things. He believed the proper medium would be an announcement through the Council on Health and Public Instruction of the American Medical Association.

Gonorrheal Conjunctivitis.

Dr. Douglas A. Payne reported an interesting case of gonorrheal conjunctivitis which demonstrated: (1) The great danger to which the public exposed themselves in allowing untrained persons to remove foreign bodies from the eye. (2) The possible danger of infection of the eye in barber shops and by barbers' utensils. (3) The necessity for hospital care of these cases. (4) The necessity for intelligent and conscientious handling of cases of this nature by careful and competent nurses. (5) The necessity for the education of the public of the dangers that lurk in unknown and hidden places.

Dr. E. S. Antisdale exhibited an instrument to facilitate the more thorough treatment of gonorrheal ophthalmia and also protect the cornea.

Unusual Retinal Lesion.

Dr. W. A. Hager, South Bend, presented a man, twenty-three years of age, who had had the usual diseases of childhood. At fifteen years of age an unusual condition of the retina presented in one eye, and two years later in the other. He wanted information from the members as to their diagnosis.

Discussion.—Dr. C. G. Darling thought the case was one of reattachment of the detached retina. The defects in the field corresponded to the part of the retina which appeared to be detached, and corresponded exactly to the white line that runs across the retina. No field below. In the other eye the field is cut off in the same manner.

Dr. W. H. Woodruff, of Joliet, said the condition was quite different in the two eyes. The white lines were quite evident. In the right eye he was not certain it represented detachment of the retina. In the left eye the lines followed the blood vessels, indicating there had been disease of the vessel walls. If it were a detachment of the retina, there was evidently the primary condition of chorioretinitis or an atrophic condition following a chorioretinitis.

Dr. W. F. Coleman said there was undoubtedly detachment of the retina, and some of the opaque fibers might be reattached. He had not seen such multiple detachments presented with an opaque lens. He thought it might be a case of angio-

neurotic edema, although he had never seen such a case, nor could he find the description of such. If any member had seen such a case he would like to hear remarks upon it.

Dr. Harry S. Gradle differed from Dr. Darling, and said from the history there was a gradual onset in both eyes extending over weeks and months, without any sudden loss of vision or sudden loss of the field of vision in any way, and there was no time in which there was improvement in vision. Detachment of the retina would mean a difference in the height of the retina at different points, and this was scarcely noticeable. There might be an atrophic condition of the choroid in one eye, particularly the temporomacular ridge, which would scarcely come under the head of detached retina.

Dr. Willis O. Nance expressed the opinion, after examining the left eye, of retinal edema being present, although he did not know the cause.

The Art Side of Lenses.

Dr. J. Whitefield Smith, Bloomington, said the expression of the eye depends in a large measure on the size and shape of the palpebral fissure so that lenses should not mar this most essential feature. He urged that the application of lenses be considered from the cosmetic standpoint.

Dr. Clark Hawley said that oculists neglected the art side in prescribing glasses for patients, so that for many years he had written every measurement for the proper glass to harmonize with and conform to the features of the face.

Orthotic Albuminuria.

Dr. Frank Carroll, of Cedar Rapids, Iowa, said the condition was not infrequent, occurring in children otherwise apparently normal; or occurring only as a concomitant symptom of a constitutional lack of development, evidence of which may be found throughout the body. Many times no constitutional symptoms are found; this peculiar albuminuria manifests itself in the eyes alone. The condition is not constant, may disappear from time to time and recur at frequent intervals. Most often found in children with a neurasthenic tendency. Sometimes it may be grave, although in the majority of cases rest is sufficient to cure the child. Sometimes the albumin will persist after all the other symptoms have disappeared. In

neurasthenic children the treatment must be general, to restore to normal the nutritional condition of the child, when the albumin will spontaneously disappear. The diagnosis of orthotic albuminuria depends very largely upon the accuracy of the urine examination, which may have to be repeated many times, although the author believes that a fairly certain diagnosis may be made by the oculist from the condition of the fundus at any time. In the case reported he examined the fundus and discovered a condition of the retina which caused him to send the patient to her family physician for urinalysis, as he suspected a slight nephritis. The physician made a careful examination and the diagnosis of orthotic albuminuria was established. The patient has been held under careful observation and is now apparently well following nonuse of the eye and general care of the body.

Dr. George F. Suker mentioned a case that came under his observation a number of years ago of a man twenty-five years of age, who has had orthotic albuminuria for fifteen years, although prior to that time did not know anything about it. After arduous labor, about five or six o'clock in the afternoon, his retina looked like optic neuritis or neuroretinitis, but after a good night's rest, the following morning the retina would be entirely clear. On Sundays he had no trouble with his eyes. Albumin could be obtained from the urine the latter part of the day, but never early in the morning. The albuminuria was not pathologic because the patient did not go on to nephritis.

If the disease persisted beyond the age of puberty, it continued always; although as a rule it stopped in the acute stage. No case had gone on to the typical picture of albuminuric retinitis. Many had asthenopic symptoms with retinal exhaustion, and showed retinal hyperemia which might be called neuroretinitis.

Dr. Frank Carroll had seen half a dozen cases other than the one he reported, and agreed with what Dr. Suker had said.

An Anatomic Study of a Case of Temporal Conus (Coloboma) in an Hyperopic Eye.

Dr. E. V. L. Brown stated that the essentials of the entire finding consist of a crescentic defect in the pigment epithelium and all the layers of the choroidea along the temporal border

of the disc in an eye of the hypermetropic type (23 mm. axial length). The choroidea stops a considerable distance temporal to the disc. Almost the entire defect is bridged over and filled out by a fold of duplication of the retina. This is a direct continuation of the two nuclear layers of the retina. The nerve fibers go over into the nervehead in a normal way. The anterior layers of the sclera are absent over the floor of the conus, but the sclera is nowhere ectatic, either behind the conus or elsewhere.

In myopic conus the length of the eyeball is increased and the choroidea torn away from the margin of the disc. The condition is, therefore, developmental and not congenital, as must be assumed in our case from the short axis. In the non-myopic eye the conus or coloboma is due to an overgrowth of the secondary optic vesicle at its junction with the optic nerve at a time when the mesoderm of the sclera and choroidea has not yet been laid down; the retinal fold then effectively blocks the development of the choroidea and sclera at the nerve and the conus results.

In the only other case reported, that by Elschmig, the temporal conus (coloboma) was deeper and involved the optic nerve sheaths.

WESLEY HAMILTON PECK,

Secretary.

OPHTHALMIC SECTION

ST. LOUIS MEDICAL SOCIETY.

Meeting of May 7, 1913.

A Case of Anterior Polar Cataract With Nystagmus and Spasm of Facial Muscles.

Dr. Clarence Loeb: M. B., age ten years, first seen April 19, 1913, because of poor vision. The right eye was apparently normal, but the left had a large, central, adherent leucoma. The left eye was inflamed when the patient was three days old, since which time there has been doubtful perception of light. On closing the right eye the left made violent nystagmic movements, both horizontal and rotatory. "On occluding this eye with the obturator and directing the child to look at the test chart, there was a spasm of the left orbicularis palpebrarum, accompanied by twitching of the whole left side of the face, especially the corner of the mouth."

Under atropin the pupil dilated well, except at two places where it remained adherent to the cornea. There was a small white spot in the pupillary area, evidently an anterior polar cataract. Atropin lessened the nystagmus and the spasms of the muscles. He spoke of the theory of the etiology of anterior polar cataract, which was supported in this case. A second case came to the clinic a couple of days ago, which was presented at the meeting. There was the same history of blennorrhoea neonatorum, with the same condition of corneal leucoma, anterior synechia, contracted pupil and anterior polar cataract in a five-year-old patient.

He also reported the case of a man who had some inflammatory condition of the right eye about ten years before. When first seen, a few days before, he had a dense leucoma of the cornea and only perception of light. On dilating the pupil with homatropin, white masses could be seen in the pupillary area, but whether they were remnants of the capsule or a mature cataract, he was unable to determine. The case is still under observation.

An Atypical Case of Retinitis Pigmentosa.

Dr. Clarence Loeb: Mr. A. M., age forty-eight years, came to the clinic at the Alexian Brothers' Hospital, on February 20th, complaining of poor vision. Left eye had been affected for five years, and right eye for about two years. Gives a doubtful history of lues twenty years previous. R. E., V. = 6/15; L. E., V. = 1/15n.; worse at night.

Ophthalmic examination: Right disc slightly smaller and paler than normal; arteries are very small and thread like. A few foci of pigment collections in retina. Left eye same as right, with additional foci of pigment degeneration of the retina, in the form of more or less globular masses in the periphery. Some crescentic and a few stellate. The history showed that in 1896 his vision had been very poor, but had improved under treatment. Is at present on mixed treatment and vision is: R. E., + 6/8 n.; L. E., 1/12; not improved by glasses. The visual fields, taken May 3d, will be passed around. The patient has three children whose eyes I have examined and found normal.

Discussion.—Dr. Post: The cause of congenital anterior polar cataract interests me especially since a late experience in my practice. An explanation has been offered that it was due to perforation of the cornea in utero. This always seemed doubtful, if not impossible to me, till the experience which I refer to suggested how an ulcer of the cornea in utero might be caused. A little girl four or five years old had arthritis of one wrist, and later the elbow joint. Shortly after the arthritis, she developed a very violent gonorrheal conjunctivitis, which followed the usual course, with perfect sight. The child had a vaginitis. Although the books speak of a metastatic gonorrheal infection of the eye attacking the uveal tract, I found no reference to metastatic gonorrheal ophthalmia or conjunctivitis following uterine or vaginal gonorrhea. The metastatic cyclitis or iritis usually appears after the vaginitis or urethritis has run its course. The gonococcus is found in the blood, and when there is a gonorrheal inflammation of a joint, sometimes found in the joint itself. This suggests the question, could a gonococcus starting from a vaginitis in a pregnant woman enter her general circulation, pass through the placenta into the fetal circulation, and from that, instead of passing through the serous membrane into a joint, could

it pass through the mucous membrane into the conjunctival sac and there produce a gonorrheal ophthalmia in utero? If this is possible, a perforating ulcer of the cornea might easily occur in utero, resulting in anterior polar cataract.

The gonorrheal conjunctivitis in the case which I have referred to and which I have reported elsewhere, seemed to come from the gonococcus in the blood, and suggested to me the above possible explanation of congenital anterior polar cataract. I searched the literature at my disposal and found nothing that I could quote in my report.

Dr. Loeb: I am pretty certain that I have read about cases of metastatic gonorrheal conjunctivitis, though I have never seen one.

Dr. Post: The books speak of a metastatic gonorrheal infection of the eye as I said, an infection which manifests itself by irritation of the iris and ciliary body. They speak of it as being a mild inflammation of the iris, not a gonorrheal conjunctivitis. Would the capsular mass be pyramidal in shape?

Dr. Loeb: We are confusing two different conditions— anterior polar cataract, which is the result of corneal ulcer, and anterior capsular, which is a congenital condition ascribed by Weeks to a partial retention of the pupillary membrane. I fail to see with that explanation why it is necessary to assume an intrauterine gonorrheal inflammation, although I do not know whether we have true congenital cataract in this case.

Dr. Luedde: I have seen anterior polar cataract with no demonstrable corneal lesion, so I do not think it is always necessary to assume a corneal ulceration.

Inoperable Orbital Sarcoma Cured (?) by the Use of Coley's Fluid.

Dr. Luedde: Coley's fluid consists of the mixed toxins of the streptococcus and bacillus prodigiosis. Its use in sarcomata is empirical, and most justified in cases where inoperable secondary growth follows the unsuccessful surgical removal of the primary growth, as it did in both of our cases. The first case, T. W., white, age twelve years, the growth returned after two attempts at removal of the tumor mass and also a complete exenteration of the orbit. No sign of relapse in nearly six years. Except during an acute inflammation of the nasal sinuses, which caused a temporary swelling, there has been no

disturbance whatever in the right orbit, which is perfectly covered by a flap from the right cheek. He is now eighteen years old and appears strong and well.

Miss E. M. W., white, age twenty-two years, first seen October 27, 1911, with a firm swelling at the upper inner angle of orbit, which had been treated by various eye washes. The only subjective symptoms were pain, which was aggravated by use of eyes in near work, and transient diplopia, especially on first rising in the morning. Vision normal in each eye.

Dr. Leavy considered the diagnosis to be a malignant growth beginning either in the frontal or ethmoidal cells on the right side. In two months there was a slow but positive increase in the size of the tumor, a gradual increase of subjective suffering as well as a slight decrease in the clearness of vision in the affected side, so that the patient consented to an exploratory operation. Operation showed that the process extended from the ethmoid and frontal sinuses back into the orbit too far to permit complete removal without interference with the right eye. Three months later, however, the patient's consent being obtained, an attempt was made to remove the mass at the upper inner angle of the orbit by removal of the frontal eminence—exposing the frontal sinus—also removing the nasal bone and scraping the ethmoidal sinuses. She stubbornly refused to have anything done which might imperil the sight of her right eye, so the location of the tumor mass made any other procedure impossible. When the outer plate of the frontal sinus was removed, it was found that the inner plate was already eroded and that curettage of the frontal sinus contents showed brain tissue among the fragments. The case was then given up as hopeless so far as the surgical removal of the growth was concerned. The patient recovered with little disturbance. It was then decided to administer Coley's fluid, the effect of which was to stop any increase in size of the mass. When last seen, September, 1913, she was apparently in excellent health, with normal vision in each eye: good binocular vision, in spite of the injury to right superior oblique by the operation. There is, however, a noticeable thickening at the right side of the nose near the orbit.

The report from Dr. Buhman on the material submitted for microscopic examination was as follows: "Fragments from ethmoid show some bony tissues and a few wandering cells of

a suspicious character. Sections from orbit almost entirely malignant new growth, with many giant cells and a few spiculæ of bone. Frontal, no new growth. Deep ethmoid, no new growth. Fragments of brain tissue."

Dr. J. M. Smith: The following notes on the treatment in this case with Coley's fluid are copied from the records of Dr. Leavy.

"From May 6th to May 30th, sixteen injections were made, all in the buttock, usually at intervals of one to two days. On the 17th, after the injection of 9 m., there was a rise of temperature to 101 degrees, with a chill one hour after the injection. An interval of five days followed before injections were resumed. By the 30th, 15 m. were injected in the buttock, with no reaction. All these injections were made with Parke-Davis & Company Coley's fluid. On the 15th of July, injections were resumed, using the fluid furnished by Collis P. Huntington of Philadelphia. Twelve m. were injected into the buttock and 1 m. intranasally in the growth. Injections were given for five succeeding days until the 19th, when 18 m. were injected in the buttock, followed by chill and temperature of 103 degrees. The gluteal region was much swollen and infiltrated. Treatment was discontinued after five days, then resumed by the injection of 15 m. in the buttock and 3 m. intranasally in the growth. After three treatments the injections in the buttock were discontinued and the quantity injected into the growth increased. On August 1st, 8 m. were injected in the growth, followed by severe headache, chill and temperature of 103 degrees. Altogether fourteen injections were made into the growth, several times followed by hemorrhage of the nose. On August 10th, injections in the body were resumed, beginning with 15 m., eight of which were given up to August 24th, on which date 24 m. were injected. The weight of the patient at this time was 119½ pounds, a loss of fourteen and one-half pounds during the three and one-half months that the injections had been given. Patient went home without treatment for three weeks, returning very much improved, having gained thirteen pounds. On September 16th, injections were resumed, with 5 m. in the gluteal region. Three days later 10 m. were given in the gluteal region and 2 m. in the growth. At the same time 12 m. were injected in the gluteal region, followed by chill and tempera-

ture of 102.5 degrees. From September 16th until October 30th eight injections were made in the growth at intervals of from two days to three weeks, increasing from 2 m. to 4 m. at the last injection on October 30th. On this date 12 m. were injected in the gluteal region, causing a chill and temperature of 102.5 degrees. Twenty-eight injections were made into the body, beginning September 16th and continuing until November 23d, increasing from 5 to 16 m. at the last injection. Chill and rise of temperature followed several times without apparent cause. On November 6th, following the injection of 15 m. in the gluteal region, a severe nasal hemorrhage had to be stopped by packing the nose. When the injections were stopped the patient's weight was 142 pounds, a gain of ten pounds during the last two months of the treatment, and a net gain of nine pounds since the beginning of the treatment, five and one-half months before. Since then she has continued to gain in weight and appears to be doing well in every way.

Discussion.—Dr. Shahan: I would like to ask the doctor if there were any remains of the tumor?

Dr. Loeb: I would like to ask the vision of that eye?

Dr. Luedde: In answer to Dr. Shahan's question, there are still remnants of the tumor in the nose, and in the orbital cavity some little thickening. As to vision, it was 15/12 when last examined.

Dr. Hooss: I would like to ask about the nose bleeding. Was it of local origin or from the tumor itself?

Dr. Smith: That was always a local condition. It was slight at times, but sometimes severe; on one occasion it was necessary to pack the nose to stop it.

A Case of Ocular Tuberculosis With Notable Astigmatic Variations.

Dr. W. E. Shahan: A case of tuberculosis of the anterior segments of both eyes, the clinical course of which extended over one and one-half years. The most striking aspects of this case were the wide variations in amount of astigmatism and position of axis. The amount varied from 0.50 D. to 3.00 D., and the change in axis varied from 2 degrees to 57 degrees. These changes were generally rather slow, and corresponded to changes in the cornea or adjacent sclera. The visual acuity varied with the changes and was always brought

to normal by correcting cylinders. The therapy was tuberculin injections, beginning with very small doses, from 1/50 to 1/25 mmg., which produced rather violent local and general reactions. The end result was recovery with an astigmatism of 1.25 D. in one eye and 2.75 D. in the other eye.

Discussion.—Dr. Luedde: I was much interested in Dr. Shahan's paper. He has followed the change in the refraction with unusual care. We are sure to find changes in the cornea wherever there is inflammation and swelling in the cornea or the anterior segment of the sclera. I do not think it is important to record changes which we all know are produced by infiltration and softening of the marginal segments, allowing the center of the cornea to be pushed forward. I have a specimen of such a patient in the later stages, showing the gradual thinning of the different layers. The globe was ruptured at the limbus by a blow.

Dr. Hooss: Just one point. Could it be possible that some of these conditions would be due to the general condition? How do you account for these frequent changes?

Dr. Shahan: The astigmatism was practically all corneal, due to changes in the sclera adjacent to the cornea and in the cornea itself. I feel reasonably certain that the tuberculous process was limited to the eye. His general condition was excellent, and during the period of treatment his weight increased about fifty pounds.

BOOK REVIEW.

**Oogheelkundige Verslagen en Bijbladen uitgeven met Het
Jaarverslag van het Nederlandsch Gasthuis voor
Ooglijders, No. 54.**

Published by J. Van Bockhoven, Utrecht, 1913.

This contains the reports for 1912 for the hospitals for diseases of the eye at Utrecht, Amsterdam, Rotterdam, 's Gravenhage, Groningen, Maastricht, and Nijmegen, the transaction of the Netherland Ophthalmologic Society in 1912, an article by P. J. Waardenburg—Onderzoek bij den mensch naar de erfelijkheid van physiologische en pathologische kenmerken van het oog, an article by J. van Eijsden—Over de beteenkenis van de accommodatie voor het monoclair dieptezien, and a review of the Dutch literature for 1912. C. L.

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VII.

PSYCHIC DISTURBANCES INVOLVING THE EYE.

F. PARK LEWIS, M. D.,

BUFFALO.

The extraordinary development during the past two decades of various cults whose tenets are based upon functional changes produced through the effect of the mind has led the public, by reason of the striking effects that are sometimes obtained through the application of mental therapy, in some of its forms, to accept conclusions which are based upon an inadequate knowledge of the data involved, and which are often as unwarranted as they are absurd. It would seem worth while, therefore, to devote a little time to the study of some of the more unusual and striking symptoms which are met, and to differentiate between these and the organic physical changes which under no conditions could be modified by the influence of the mind of the subject, either by autosuggestion or by the suggestion upon him of some mind other than his own. There is much doubtless that we do not understand concerning the effect of the mind upon natural bodily conditions, but so much has been carefully investigated and observed, both by the psychologist and therapist, that we are in position today to differentiate more accurately than ever before between those physical symptoms which may be modified by the mind of the subject and those which may not. We consider ourselves to

be a sane and well balanced people, but the conditions under which we live, together with the fact that we are naturally highly organized nervously, make our people, like those of Latin blood, peculiarly susceptible to psychic influences.

Hysteria is not always, as we are sometimes led to believe from textbook descriptions of it, an unrepressed expression of emotion associated with convulsive contortions on the part of an excitable woman who has been the victim of a nervous shock. Its manifestations are of more varied character, and may be, and frequently are, accompanied by a placidity of demeanor that is quite misleading as to the actual nature of the disturbances from which the subject is suffering. Indeed, not infrequently the victims of psychoses are exceedingly quiet in manner and appear to be absolutely selfcontained. Not infrequently the manifestations of hysteria may be accompanied by actual pathologic conditions of greater or less severity, and in these cases the separation of the real from the assumed or imagined symptoms may be a matter of great difficulty. The nervous disturbances which we find may be shown in either an exaggerated or in a diminished functional activity. They may be located in obscure organs, and may seemingly be disassociated with any general symptoms of a nervous character. The importance then of this subject to the ophthalmologist lies not only in the fact that the diagnosis must be made in definite and pronounced conditions as to the bearing which the psychic element exerts, but even in ordinary examinations in which there are possibilities of exaggerating or minimizing symptoms this element must be reckoned with; for the range extends from the simplest variations from the normal to those of most pronounced character.

A most interesting case comes to my mind, that of a woman of middle life who had a most complicated muscular-refractive condition in which high compound spherical cylinders were combined with vertical prisms, and in which the patient, who had been a sufferer for many years, was restored to a life of usefulness and comfort, but who suddenly developed a severe and persistent headache upon which no treatment which was applied seemed to produce the slightest result. Under the influence of a "christian science" friend the headaches wholly disappeared. In this particular instance, as there was no remaining organic cause to which they could be attributed, her

mental state had doubtless an important bearing upon her condition. The sense of happiness and comfort which she experienced was the one thing necessary to effect her cure. That this condition was warranted by the facts was shown in that, notwithstanding her continued belief in the efficacy of christian science, she was unable to go without the glasses by which the organic differences in her eyes were adjusted, without suffering great discomfort.

The exaggerated sensation of pain, the inability to perform certain functions, whether of the eye or of any other part of the body, is influenced in large degree in those who are susceptible, by the mental condition of the subject. After a very small operation on the cornea or on the eye muscles I have seen patients thrown into a brief epileptiform condition, from which they quickly recovered without having any return of a like condition. When about to operate on an elderly lady for cataract, she, having an irritable heart and a highly nervous organism, suddenly became convulsive, losing consciousness, but under a stimulant she quickly recovered, and the operation was finished without accident. I have seen a strong, well-developed man fall on the floor with convulsive twitchings of the limbs after the removal of a foreign body from the cornea. Cases of this character are of sufficient frequency and of such a puzzling character as to warrant their very careful consideration, while the more marked cases are sufficiently distinctive to stand in a class by themselves. There are certain phases of the subject, in the ordinary daily work of the ophthalmologist, which are deceptive unless they are understood. The insistence on the presence of great pain when we know that it cannot exist, the assurance that the sight has diminished when our tests show it to be normal, and the undue emphasis laid upon minor symptoms, all require the nicest discrimination, and unless recognized may be most misleading. Major cases of hysteric functional disturbances are by no means so common; the following is a most interesting case in point:

HYSTERIC AMBLYOPIA.

Case 1.—A little girl, ten years old, was brought to my office by her father with the statement that she had suddenly gone blind. She had within a short time been refracted by a very

excellent ophthalmologist in a nearby city, and on her return to an adjacent village was discovered to be so nearly blind in one eye that she refused to recognize the difference between the bright light in my dark room and absolute darkness, while with the other eye vision was reduced to $4/200$. The most careful examination of the eye grounds failed to give the slightest reason for her loss of sight, and in the eye which was said to be blind the pupillary reflexes were perfect. There was no doubt, however, that the child believed herself to be blind. For some time she had been led about by her parents, and the case had been looked upon by the surgeon who had been consulted as a most obscure one. The absence of any definite reason for her loss of sight assured me that it was her mind which was blind and not her eyes. I referred her, therefore, to my friend, Dr. Edwin A. Bowerman, whose wide experience in neurology warranted him in assuring me that no organic lesions were anywhere present. The treatment employed was wholly of a psychic character. The child was assured that she was not blind; that she would very soon be able to see again. The eye in which a little sight remained was bandaged, and she was sent into another room and told that she would within a very short time be able to guide herself; within half an hour she was avoiding chairs and could distinguish the fenders in the fireplace, and within three weeks her vision without glasses, which had been prescribed for her, had risen gradually to normal in one eye, and to $20/40$ in the other, in which was found a permanent amblyopia. The origin of the hysteria was exceedingly interesting. The child was highly hyperopic, one eye being also amblyopic, and her attention had not been called to this until it was brought to her notice by the refractive test. On returning home she realized, partly by reason of the stronger glasses, and partly by reason of the fact that the amblyopia had been brought to her notice, that she was not seeing clearly. She said to her father, an excitable and neurotic Methodist minister, "I can't see." The father, growing obviously nervous and excited, observed to the mother, before the child, "Nellie is going blind." The mother, equally excitable, agreed in this conclusion, and Nellie, being of the same neurotic strain, immediately proceeded to go blind. As it was a suggestion which led her to lose her sight, it was equally possible by means of suggestion to restore it.

PSYCHIC BLINDNESS.

Case 2.—At about this same time another girl, of about the same age, having similar extreme symptoms, was also led into my office. This time it was a case of interstitial keratitis, which required three months of energetic treatment before being cured. One cannot but realize that had both of these cases fallen into the hands of christian scientists or mental therapists, the one would have been heralded as a most marvelous cure, being within the range and suitable for mental treatment; the other child would have become blind.

Some time after that another young girl, this one about fifteen years old, was sent by her employer to me because of her failure to recover, under the care of a colleague, from what seemed to be a very serious condition involving her sight. Her eyes had begun to trouble her several months before, and she had received glasses of small refractive value. Three weeks before coming to me the sight in her right eye had rapidly decreased until the 30th of July of the present year, when she was found to have for the right eye vision of but three feet for fingers, and for the left eye $6/8$. As in the former case, no lesion of any character whatever could be found in the eye grounds. The pupillary reactions were normal, although the pupils were somewhat large. She was quite without symptoms except the unexplainable loss of sight. Her nose and pharynx were in good condition, but she had had severe hemorrhages from the nose in the early spring, which continued for the greater portion of a week, sometimes occurring three times daily, from which she had lost a large amount of blood. There was a small black pigment patch near the macula of the right eye, but otherwise the eye grounds seemed to be in perfectly normal condition. She had lost her father rather suddenly three months before, and had been depressed in consequence. The family were in greatly reduced circumstances and were largely dependent upon the efforts of this child for their support. She evidently was suffering from a purely psychic depression. The loss of her father, the unexpected burden thrown upon her untrained shoulders, and probably largely the fact of a lack of sympathy on the part of her fellow workers was more than this frail, sensitive child could endure. She was reassured and made to understand

that her employer was interested in her welfare and that she would rapidly recover her sight, which she immediately proceeded to do.

HYSTERIC BLEPHAROSPASM.

Case 3.—On September 3, 1912, a girl of twenty years was brought to my office by her father from a small town in Pennsylvania. Her head was enveloped in a multitude of black wraps, and it was with the greatest difficulty that I was able to get her to allow me to see her eyes in order that they might be examined. She had been troubled with her eyes for six years, and for four years had suffered so much from photophobia and involuntary spasm of the orbicularis that she was not able to bear the least amount of either natural or artificial light. Unfortunately she had been very badly advised, frequently being kept in a dark room for weeks at a time by her physicians, and always directed to protect her eyes from the daylight when she ventured into the bright light. With great difficulty I finally succeeded in allowing her to permit an examination of her eyes, but found absolutely nothing of an abnormal character. There was no inflammation either of the lids or of the eyeball, and no evidence of any disturbance in the fundus. With great difficulty I succeeded in determining the refraction and found only a small amount of astigmatism with normal vision in each eye. She had a sensation of tension and swelling in the forehead, a numb feeling in the legs when she read, and she could not bear to look upon bright colored or striped cloth. She complained of intense pain in the back of the neck when she made any physical effort, had much aching in the back, and on the advice of her physician had used iodine on the neck and fly blisters on her back. In order to be reassured as to the physical condition, she was referred to my friend, Dr. R. M. Schley, of wide neurologic experience, who, after a careful examination, found the only physical defect to be a floating kidney. This was corrected by a suitable support, she was given glasses for a moderate astigmatism, and was definitely made to realize that her eyes were in no danger and could and should be used. Her confidence was reestablished, the bandages were taken from her eyes, and she was made gradually to accustom herself to the light. Within

three weeks she was bearing ordinary light without discomfort, and within two months was able to use her eyes with perfect freedom. She had lived in a little town, had become extremely self-centered, had a slight irritation in her eyes which she was led to believe was serious, and this misapprehension had been sustained by bad advice during four of the most important years of her life, which were absolutely lost to her.

ARTIFICIAL HYSTERIC ULCER.

Case 4.—After an absence of several weeks I found in my clinic of the Charity Eye, Ear, Nose and Throat Hospital a young girl who had an angry abraded ulcer on the skin in the corner of her left eye. She had been attending the clinic for several weeks, and measures that had been employed for her relief seemed to be totally insufficient in curing it. Her general condition appeared to be quite good, although she was a frail, sensitive child of sixteen. There could be no apparent explanation for the development of such an evidently non-infected sore. It had all the appearance of being due to a local irritant, and no adequate explanation had been given. The girl was exceedingly quiet and seemed to be greatly depressed. Inquiry as to the conditions under which she was living was unsatisfactory, so I asked my friend Dr. Schley, whose interest was not wholly neurologic but also in general social betterment, to visit the home of the child and find what the existing conditions were. This delicate girl was found to be living alone with an insane mother in impoverished condition. She was afraid, and was as hungry for sympathy and moral support as for material nourishment. She at least met her human kind and had some attention paid to her on her visits to the out-department of the hospital, so she had deliberately made the sore and kept it up. Her mother was sent to the State Hospital, where she belonged, the girl put under right conditions, and a problem of social importance was solved at the same time that the girl received the necessary assistance. In such morbid surroundings it is quite possible that the girl would have accompanied her mother to the hospital for the insane had not right conditions been provided under which she might live.

OCULAR NEURALGIA SIMULATING GLAUCOMA.

Case 5.—It is not only young women who suffer from such conditions as this. In August last I was called in consultation to see a patient by a physician who had been treating him for glaucoma and failed to relieve the intense pain by repeated applications of eserine. I was called to make an iridectomy. The man, who was a railroad employee, had gotten a cinder in

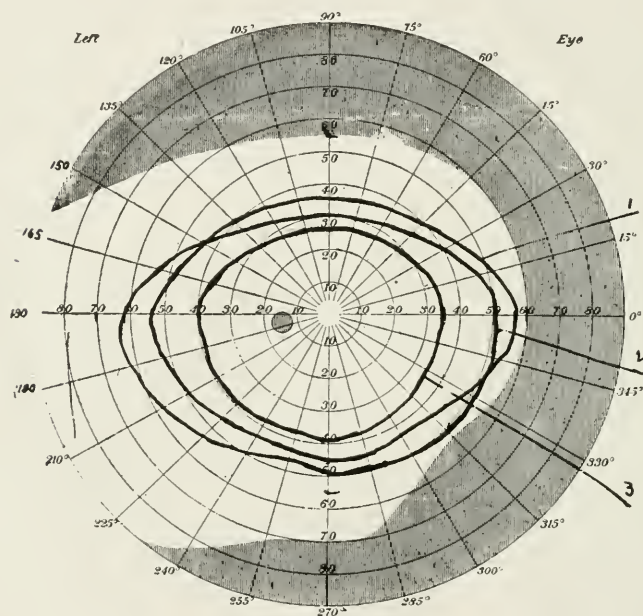


FIGURE 1.

1. Green field. 2. Red field. 3. Blue field.

Does not determine colors readily, but shows no scotoma.

the left eye, which had been quite properly treated during the month of July of 1912, but in his own mind the importance of the condition had been greatly overestimated, and in this he was supported by a very nervous wife. In November he consulted another physician, through whom he ultimately came under my observation. He seems to have suffered intense pain in his eye from November of 1912 until February of

the present year, and in May he had a slight attack of pseudo-paralysis of the right side. He had been wearing myopic cylinders for a hyperopic astigmatism differing in degree and angle in both eyes; the visual fields were inverted; the eye ground showed no changes, and vision in each eye was normal. He was simply panic-stricken and assumed that he was going blind. There was some increased arterial tension, but he was suffering from hysteric panic. In order that any actual lesions might be eliminated in an understanding of his condition, he was referred to my friend Dr. E. A. Sharp, whose report is appended.

"August 7, 1913. G. G. Cinder in left eye July 10, 1912. Took morphin on account of pain up to two months ago. May, 1913, had sudden paralysis of right side. Fell unconscious while going to bathroom. Right hemiplegia. Arm and leg paralyzed. Tongue thick and difficulty in speaking. After four or five days speech became normal. In three or four weeks could walk with use of cane. Gradual improvement since. Right foot gets tired and numb easily. Pains of shooting character occur at times in right leg.

"Physical Condition.—Large, heavy adult. Complexion clear. No deformities of skull nor vertebral column. Heart and lungs normal.

"Mental Condition.—Says memory is not as good as formerly. Since accident to eye in July, 1912, has been unable to work. Worries about his position. General neurasthenic symptoms, easily fatigued, etc.

"Cranial Nerves.—Discs not perfectly clear, but no swelling observed. Narrowing of visual fields (tested for form only). Ocular movements good in all directions. No nystagmus. Roving, restless movements of the eyes. Complains of diplopia when looking to right or left. No strabismus detected. Has single vision when both eyes are open, but says he sees double when one eye is closed. (Hysteric monocular diplopia.) On suggestion the separation of the two images can be regulated.

"Motor Functions.—Right hemiparesis. All movements of right upper and lower extremities are performed with much less power than on left. No incoordination or ataxia. No associated movements. No adiadochocinesia. No tremors in

outstretched hands. Range of movements equal right and left. No rigidity. Muscle tone good and equal right and left. No atrophy nor hypertrophy. Weakness of voluntary movements on right appear to be due to lack of mental effort with inhibition, and not to actual motor loss. Gait slightly shuffling and some scraping of right foot, but no spastic nor ataxic character. No Romberg sign.

"Sensory Functions.—Pains in stomach and bowels at times. Sometimes has severe headaches. Complains of numbness in right foot, but there is no loss to be demonstrated objectively. Joint and muscle sense normal.

"Reflexes.—Biceps, triceps, radial, abdominal, patellar and achilles reflexes present and equal right and left. Plantar flexion right and left. No Babinski, Oppenheim, Schaefer, Chaddock, nor any other reflex indicating organic lesion of the pyramidal tract. The right hemiparesis appears to be of functional nature and not the result of a cerebral hemorrhage or thrombosis, and is in keeping with the ocular symptoms of narrowing of the visual fields and monocular diplopia."

"When he insisted that he had pain in the eye he was told definitely that he had not; he was made to understand that the difficulty was largely imaginary and exaggerated by his own fear. He was made to use autosuggestion and told to reassure himself that nothing was going to happen that would be disastrous to him." He had been suffering for nearly a year, but needed only this reassurance to enable him to reestablish himself. His physician thought he had glaucoma, had given him to understand that he had glaucoma, and had told him the symptoms of glaucoma so that in the event of an unexpected attack he might immediately seek help, and had then given him eserine of nearly ten times the usual strength, which actually produced great pain; and so the patient had all the symptoms of glaucoma without any of the organic changes which accompany this condition. He got well when he was told to.

Many of these psychoses are primarily caused by a traumatism, as in the following case: The anamnesis was taken by my friend Dr. A. E. Sharp, to whom I referred him. The following is Dr. Sharp's report. I think that from the symptoms and result it may be definitely called a hysteric ptosis:

"J. V., age eight years. July 26, 1913, while playing, fell in raspberry bush. Struck below right eye. Eye swollen;

could not open it immediately following the accident. Has been unable to open the eye until today (August 9, 1913).

"Present Condition.--Ptosis of right eyelid. Lid can be raised by frontalis sufficient to see when shield is placed over left eye. Paralysis of right sixth nerve. No movement outward of right eye. Movements inward normal. Marked weakness of movements upward and downward of right eye. Pupils unequal, right larger than left. React to light directly and consensually. No reaction in right pupil on effort to focus on near object nor on convergence. Left pupil reacts to convergence. Right internal strabismus. Diplopia. No nystagmus. Fundus and fields normal. No disturbance of fifth nerve. No weakness of upper or lower face on voluntary movements, under effort, but in ordinary conversation the right face moves less than the left. Suborbital reflex present and equal right and left. Hearing acute. Other cranial nerves normal. Sensory functions normal. No objective loss over any segment. Power and range of movements good and equal right and left. No incoordination nor ataxia. No tremors. Muscle tone normal. Reflexes of upper and lower extremities present and symmetric.

"Brother of patient, who accompanied him, did not observe the onset of the trouble, and the history regarding a febrile disturbance, etc., at the time of onset, two weeks ago, could not be obtained. The patient admits having had headaches at onset, but states that he was perfectly well prior to the fall in the berry bush.

"The paralysis of the ocular muscles resembles that which occurs occasionally in poliomyelitis, although there is no history of other symptoms of poliomyelitis obtainable.

"The case appears to me to have some organic disturbance, possibly of vascular or toxic origin. There is considerable functional disturbance also, but I hesitate to place it entirely in that category."

Psychosis may have an actual physical origin. The following is a most interesting case in point:

AGARAPHOBIA WITH ASTHENOPSIA DUE TO NASAL OBSTRUCTION.

Case 6.—A patient of mine, whom I had not seen for a year, a man of thirty-eight years, returned to be rerefracted, as he was unable to use his eyes with comfort. An inquiry into his

condition developed the fact that for a number of months he had been a nervous wreck; had been obliged temporarily to resign an important business position and was planning to take an extended vacation in the South. He had suffered for years from agoraphobia; he had a sense of terror whenever he entered a crowded room or any place where there were a number of people. He could not bring himself to take a railroad journey. On one occasion he had gone to the depot, looked in and saw the crowds of people, and ignominiously turned around and went home again. He simply could not go in. He would occasionally waken in the night with this sense of terror, and unless it could be controlled his business future would necessarily be destroyed. An examination of his eyes developed nothing new. Refractive errors had been fully corrected, and there were no conditions that would account for the trouble from which he was suffering. He mentioned, incidentally, that he never got quite enough air through his nose, especially when he lay down at night. There was not enough obstruction to prevent his breathing, but there always was the feeling as though the amount of air was restricted. An examination of his nose developed enlarged middle turbinates narrowing the air space; these were removed with the effect that the insomnia from which he had been a constant sufferer was almost at once relieved, and gradually with the restoration of confidence the fear of crowds disappeared. He was able to resume his business and go when and where he pleased.

The analysis of the case is the most interesting feature connected with it. There was not obstruction enough to seriously interfere with his breathing. There was enough, however, to so limit the amount of oxygen received, that after several hours of sleep there would be a slight sense of suffocation. Any of us who have suffered from a sudden lack of sufficiency of air or a feeling that we are going to be suffocated, will understand the sense of terror to which this gives rise. It is much the same feeling that on experiences of being suddenly plunged under water. It is not that the deprivation of the air has been enough to seriously affect the respiration, but the mental feeling that one cannot breathe, gives rise to this sense of sudden terror. When this fear occurs during sleep it so affects the subconscious mind that even after awakening the sensation

persists, although the cause may have disappeared. A crowded room or a crowded car is associated with a vitiated atmosphere. As soon as this patient entered such a room, unconscious though it may have been, the realization of the limitation of oxygen caused the subconscious mind to respond with the sense of terror that he had experienced in his sleep until the habit was established and he associated the sense of fear with a crowd. The essential basis of his cure was that he must be made organically able to get an adequate supply of oxygen at all times.

The cases reported are typical of a large number that occur with greater or less frequency in the practice of all physicians. The observation of abnormalities of the eye in hysteria is not of recent date. In 1680 Charles Lepois described with considerable exactitude hysteric amaurosis. In his case were present cutaneous anesthesia, deafness and blindness. Probably because of the susceptibility of the Latin people to nervous crises, the most exact studies as to the nature and manifestations of hysteria have always been made by the French. The most complete monograph perhaps ever written on this subject is from the pen of Dr. Pensier, on "The Eye in Hysteria"; and while his work has never appeared in English, I am largely indebted for the following facts to a synoptic translation made by myself some years since.

In each case in which hysteria is suspected, it is first necessary to determine whether the eyes of the subject, aside from the hysteria, are in a normal or a pathologic condition—either may be the case. In the normal eye there are no obvious outer signs which would indicate the presence of hysteria. Robbin has said that, "even aside from the attack, one is struck by the peculiar appearance of the eye of the hysteric (but this is by no means always true). The lids, if not hyperæsthetic, are widely opened, and rapidly shut with a blinking motion; the globes move aimlessly from side to side, the movements being as incoordinate as are the ideas of the subject. Those indications, however, are neither sufficiently definite nor constant to be characteristic of the neurosis." Indeed, I have rarely found any of the more marked symptoms of the hysteria obtrusively present—they must all be sought for. In testing the visual field it will almost always be found that there exists some unusual form for the field of colors; it will be noted

that the range of field has been no longer maintained in the usual order—of the white, blue, red, and green. The red and blue closely approach the limits of white. The circles of white, red, and blue have almost become tangents. Blue occasionally becomes the peripheric color. Not infrequently the colors do not maintain their respective relations: the field of red may be greater than that of the blue, even the red may become peripheric. The green is most constant, but in very exceptional instances this may be found to be the larger field.

MODIFICATION OF THE SENSIBILITIES OF THE OCULAR REGION.

Anesthesia of the palpebræ is of rare occurrence disassociated with hemanesthesia. Charcot and Ferree have found in some instances that hysteric insensibilities of the tegument may be limited to the skin of the orbit as well as involving the conjunctivæ. I have myself found this to be true. A well-known feature in connection with anesthesia of the ocular membranes is the preservation of the glandular reflex. Notwithstanding the lack of sensation, excitation of the conjunctiva will produce an abundant flow of tears. The secretion is produced rather more slowly, however, than in the normal eye.

One of the most interesting and as yet unexplained features connected with hysteria is the existence of the hysterogenic zones in the ocular region. There are those which may be associated with a spasmodic action and those which produce a lethargic condition. Pansier says that toward the close of a hysteric crisis if, without special purpose, we should blow on the eyes of a patient, we may find immediately a hypnotic condition to supervene. We may repeat this maneuver in each attack toward the close of the crisis, and each time with the same result in the same way. Compression of the ocular globes may produce an opposite result, and the hypnotic condition may become the spasmodic.

A case is cited by Ribalkin of a young girl in whom compression of the eye excited a lethargic condition of the opposite side of the body. In other cases convulsive attacks have been produced by compression of the ocular globes. Lichtwitz, who made careful experiments, claimed to have located definitely certain spasmogenic points in the conjunctiva, cornea, and the lacrimal canal, while Charcot demonstrated the exist-

ence of corresponding hysterogenic zones in the deeper ocular structures which may be excited by a more or less prolonged action of rays of light. One of the earliest prodromal symptoms is an appearance of or increase in the amblyopia. This is associated with a complete loss of vision for colors and diminution of the central acuity. Mydriasis irresponsive to eserine has also been described. Usually the pupil is perfectly responsive to light. Following an attack, temporary contraction of the ocular muscles has been observed. Monocular diplopia with spasm of the accommodation has also been recognized. Hallucinations of sight are not unusual. These sometimes take on the form of a ball of fire or the grotesque figures of the bodies of animals. In the hallucinations, unlike those of alcohol, the figures are said to be luminous; they appear on the side, usually, of the hemianesthesia.

It is not necessary to go into a detailed consideration of the various symptoms which have been found in hysteria, but one is of very great importance, and its early recognition may save great trouble. It is that in which there is great difficulty of using the eyes, notwithstanding the nonappearance of any corrigible conditions which would be adequate to explain the discomfort suffered. It is a form of nervous asthenopia, described by Donders as painful accommodation. It is also known as hysteric ocular neuralgia. It is more frequently found in women. It is described by Abadie, who says, "There is no practitioner of experience who has not found among his feminine clientele those who are unable to use their eyes for a moment without experiencing violent pains in the head and most severe photophobia, with aching in the frontal and periorbital regions. There will also be burning of the lids and a sensation as if there were dust in the eyes. Usually no refractive anomaly is present, nor is there any abnormality of the fundus to be discovered. The women in whom the conditions are most likely to be found, according to Nuel, are unmarried women who are no longer young, or married women who are sterile." Hysteric ophthalmic migraine sometimes accompanies or precedes an attack, which may be produced by the compression of certain points termed migrainogenic zones. Hemianopsia has never been found with those forms of migraine. Hysteric involvements of the muscles of the eye are both interesting and peculiar. Nystagmus is rarely seen.

Blepharospasm is not infrequent, and may be either clonic, tonic or pseudoparalytic. Wilbrand and Saenger devote many pages in their monumental work to the consideration of forms of hysteric ptosis usually produced by some slight injury. The whole subject is invested with great interest, as it necessitates a refinement of diagnosis in separating the imaginary from the pathologic, in enabling one to understand and to explain the difficulty sometimes met with in securing responses when disturbing symptoms persist, notwithstanding the fact that normal conditions have been restored, and in applying, where necessary, psychic therapeutics and thereby obtaining results which cannot be secured through other means.

VIII.

A STUDY OF THE EYE GROUNDS IN PSYCHOSES.

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A study of the ocular conditions of psychopathic individuals has revealed a relationship existing between the psychosis and certain changes in the eye. The knowledge of such relationship serves as a valuable aid to both the psychiatrist and the ophthalmologist in diagnosis and prognosis of many brain lesions.

The pupillary phenomena are described at great length in encephalomyopathy, in some instances being of almost pathognomonic significance. Certain disturbances of motility of the eye, with or without associated disturbance of accommodation, are regarded as strongly indicative of central lesions, while interruption of reflex arcs often supply evidence for location of the lesion.

Certain observers have described changes in the ophthalmoscopic appearance of the eye occurring in given psychic conditions, but with the exception of well-defined changes found in a few psychic states due to some organic brain disease, these observations have not been sufficiently confirmed to make them of special diagnostic value.

Considering the optic nerves as commissures of the brain, we would expect to find more constant and more definite eye changes in psychoses due to extensive pathologic changes in the brain than in the functional psychoses, and this has been found to be so. Arteriosclerosis and high vascular tension are often accompanied by visible changes in the retinal vessels, such as cork-screw appearance of arterial twigs, arteriovenous compression, with or without distal venous dilatation, dull red

congestion or arterial edema of the optic disc, and marked perivasculitis and hemorrhages.

These changes are particularly important because they form a frequent and early sign of general arteriosclerosis, especially of the brain and kidney.

Chronic meningitis and hydrocephalus, together with tubercles of the brain, are quite often the cause of an optic neuritis, and an ophthalmoscopic examination may reveal the early stages of the disease.

Bull states that about thirty per cent of all syphilitics, particularly those who complain of headache, suffer from hyperemia of the optic nerve in all stages from almost normal quantity of blood in the arteries to a marked choked disc.

In tumors of the brain, optic neuritis is said to occur in from seventy to ninety per cent of all cases, thus forming one of their most important symptoms. "This symptom," says Fuchs, "is the more deserving of consideration, inasmuch as a cerebral tumor may often run its course for a long time without producing any other positive symptom" . . . "Accordingly, in every case in which there is a suspicion of the existence of a cerebral affection, the fundus of the eye should be examined with the ophthalmoscope."

It is in cases of psychoses without definite pathologic cerebral changes that the most discriminating examination must be made and the greatest amount of judgment exercised in pronouncing a diagnosis. Here the changes are usually slight, if found at all, and comprise changes in the nerve head and retina.

We recognize three groups of pathologic coloring of the papilla, given by Wilbrand and Saenger as follows:

1. A pigmentation of the optic disc.
2. An increase in amount of blood in the vessels, and increased redness of the papilla.
3. A decrease in the quantity of blood in the vessels, a marked pallor of the papilla.

It is with the second group that we are more concerned in these cases, as most of the changes described in certain classes of psychoses are of segmental increased redness of the papilla.

An increased injection of the papilla may be congenital or acquired. This, however, is in most cases accompanied by a prominence of the optic disc, and if acquired is due almost

exclusively to inflammatory processes. The color of the normal papilla is determined by the translucent condition of the lamina cribrosa in the transverse section of the medullated optic nerve, and by the filling up of the capillaries and small vessels of the papillary tissue, which is almost completely transparent. In ordinary lamp light the optic nerve appears of a whitish color mingled with red, the latter due to the large number of capillaries in the optic disc. In the medial half this reddish color tone is more marked than on the temporal side, because the mass of nerve fibers which pass across the edge of the papilla in the direction of the macula is less.

The appearance of the reddish color tone is very different in different individuals, because of the difference in the comparative amount of pigment in the choroid, the actual or apparent size of the disc, due to variations in the size of the eyeball or to changes in refraction, and because of the greater transparency of the tissues in youth, where the papilla is more red than in older people, where it appears more gray.

We distinguish then:

1. Simple hyperemia.
2. Hyperemia with edema of the papilla.

The latter we further divide into two groups:

1. Simple neuritis, neuroretinitis.
2. Choked optic disc.

In speaking of simple hyperemia, it is evident that it cannot be diagnosed as pathologic unless it developed while the patient is under the eyes of the observer, as a simple hyperemia of the papilla in itself takes its course without disturbing the functions.

In inflammations of the papilla we distinguish in the ophthalmoscopic picture:

1. Neuroretinitis.
2. A choked optic disc (with extensive edema of the papilla).
3. A simple neuritis optica (without extensive edema of the papilla).

The ophthalmoscopic picture of an inflammation of the papilla only shows that there exists a more or less intensive hyperemia, edema and streaks of the papilla, not that the inflammation extends back into the optic nerve trunk. Here

again the picture is often confusing, and a papillitis may be mistaken for an habitual condition; the so-called pseudoneuritis, which is often observed in extreme hypermetropia. In pseudoneuritis there is such a congenital thickening of the supporting tissue between the nerve fibers that the papilla becomes very prominent, has a turbulent, reddish appearance, with its boundaries covered with radiating streaks. The height of the papilla may reach 10 D. Fine floating opacities in the vitreous will also give to the nerve head, and to a less extent the whole fundus, an appearance of increased redness.

Differential diagnosis of the condition of the eye ground is thus seen to be complicated when upon an habitual condition we have imposed changes commonly found in cerebral affections of organic pathologic or toxic etiology. In order to carry this out we must bear in mind the possibilities of simulated pathologic conditions, and eliminate, so far as possible, all sources of error by making the examinations under the best circumstances. We must take into consideration any external condition or disease of the eyeball itself or the adnexa, the condition of the refractive media, gross errors of refraction, the size and shape of the pupil, the comparative size and shape of the disc, the relation of the arteries and veins, the natural pigment of the fundus compared with the complexion of the individual, associated, independent general disease, and finally the acuity of vision.

Comparative readings for color discrimination should always be made with the same kind of light, as the red of a fundus appears darker when viewed by a gas light than when illuminated by electricity.

In the study of the eye grounds in over a hundred unselected cases of psychoses, I have made a comparative table of the conditions found. These patients were all from the Psychopathic Hospital, in varying stages of the psychosis, and examined under the same environment. With the exception of a few cases which were examined at the bedside with an electric ophthalmoscope, they were all examined in a dark room by a gas light from an Argand burner, and with a Loring ophthalmoscope fitted with a concave mirror. All observations were made by the direct method, the patient's pupils in every case having been previously dilated.

On the basis of whether there was an organic condition responsible for the mental disorder of the patient, these cases have been divided into four groups:

1. Psychoses due to or accompanied by organic brain diseases.
2. Imbeciles and epileptics.
3. Dementia precox.
4. Functional psychoses.

From the table it may be seen that of thirty-five cases belonging to the first group, a diagnosis of normal fundus was returned in fourteen, or forty per cent.

Out of five cases belonging to the second group, a normal fundus was found in four, or eighty per cent.

In the group of dementia precox cases, eleven out of fifteen, or 73.3 per cent, presented no abnormal fundus changes.

In the last group of fifty-two cases, a diagnosis of normal fundus was returned in twenty-six, or fifty per cent.

It is notable that in the first group of cases, eight were cases of general paralysis, five of whom showed no changes in the fundus, while only two others showed a neuroretinitis. One other, with retinal hyperemia, showed evidence of old cyclitis and descemetitis.

A positive Wassermann reaction was obtained on both the blood and cerebrospinal fluid in all of the cases of general paresis, while of the cases of cerebral syphilis the Wassermann reaction was positive in blood in all cases, and in cerebrospinal fluid in two.

It is interesting to note here, in passing, that out of the eight cases of paresis, three retained normal pupillary reactions to light, while there was only one case of myosis, two of mydriasis, and two with Argyl-Robertson pupils.

Out of eight cases of psychosis due to cerebral arteriosclerosis, four showed well-marked retinal arteriosclerosis, two a low grade of neuroretinitis, and two a central choroiditis.

The questionable nature of the etiology of dementia precox makes this group in itself an interesting one.

Blin in 1905 attempted to show that the retinal changes are analogous to those seen in the various acute and chronic infections, on the basis that dementia precox was an autoinfectious disease. Of eighty-seven cases, some abnormality of the

papilla was found in fifty-nine. Among the abnormal conditions found were:

- (a) Constant hyperemia of the discs.
- (b) Transitory congestion.
- (c) Constant anemia.
- (d) Intermittent anemia.
- (e) Congestion alternating with anemia.

Tyson and Clark examined one hundred and nine cases of dementia precox with the ophthalmoscope, and report abnormality of the papilla in all cases under study, as follows:

Low grade perineuritis.....	O. D. 62	O. S. 67
Temporal pallor, nasal cong....	O. D. 10	O. S. 11
Pallor of discs	O. D. 37	O. S. 31
	109	109

Quoting from Tyson and Clark:¹ "The fundus changes as seen clinically may be divided into three groups, which are usually, in the order of their occurrence, as follows:

"1. Congestion of discs; hyperemia and edema; dilated, dark colored veins; slightly contracted arteries, and blurring of the edges of the discs, all varying in degree. These changes constitute a low grade of perineuritis of the optic nerve.

"2. Congestion of the nasal side with temporal pallor of discs; dilated veins, contracted arteries.

"3. Pallor of discs, dilated veins, contracted arteries. These changes constitute anemia and partial atrophy of the optic nerve."

They assert that "the disc changes in dementia precox have some resemblance to those seen in the toxic amblyopias of tobacco and alcohol." "The primary departure from the normal in the discs is in the veins. They become dilated, tortuous and darker than normal. Edema of the disc appears shortly afterward. These changes are analogous to the passive congestion seen in the face and hands in dementia precox cases."

I have been unable to find other observers who have reported papillary changes in 100 per cent of their cases. Most of the cases of dementia precox in this series were in the early stages of the disease and showed no abnormality of the fundus.

One case, of paranoid condition, deserves special mention because of the autopsy findings.

Case No. 2762.—Male, aged forty-eight years, pharmacist, was examined November 13, 1912. Vision: O. D., 5/5; O. S., 5/4. Pupils small, regular, equal, reacted to direct and consensual light stimulation, and in accommodation, but very sluggishly.

Ophthalmoscopic examination revealed discs round, margins slightly veiled nasally, shallow physiologic cup, lamina cribrosa barely visible. The foveal reflex was not present, the macular region being darkly granular. There was a slight venous pulsation present over the disc in the right eye, but no retinal vascular changes. Fields showed irregular contraction with interlacing of the red and blue.

About May 20, 1913, patient became violent for a few days, after which he was comatose until death on May 27, 1913. When examined on the 25th, there was nothing new in the fundus except probably a slight congestion of the nasal side of the disc. There was no swelling of the nerve head or retina, nor other evidence of vascular disturbance.

Examination of the brain showed extensive fatty degeneration of cortical cells.

In this series of dementia precox cases, eight, or 53.3 per cent, showed blurring of the disc margins with congestion of the nerve head, but only three of these could be construed as being abnormal. Of the retinal changes, arteriovenous compression was found only twice, edema twice, hyperemia, contracted arteries, and perivasculitis once each.

At the same time that these examinations were being made notes were kept on the fundus appearance of one hundred normal cases, all students in the university, who came in for refraction, and were examined under exactly the same conditions. In these one hundred normal cases marked veiling of the disc margin with congestion was found in nine cases, or 9 per cent. As these cases in no instance gave evidence of impaired vision beyond that resulting from errors of refraction, the fundus condition must be considered as within the limits of normal variation.

The fourth group of cases comprises a wide range of mental conditions not associated with any known central pathology, and includes cases of all ages and general physical con-

ditions. No attempt has been made here to rule out any physical condition that would produce a fundus change, for such condition is considered as comitant with if not causative of the mental disorder, and hence any symptom should be described as belonging to that condition.

Of the fifty-two cases of this group, twenty-eight came with a diagnosis of maniac depressive insanity, eleven of whom, 39.2 per cent, had no fundus change, while of the whole group, 50 per cent presented no fundus change. The abnormalities found here were: arteriosclerosis, five cases; low grade neuroretinitis, five cases; papillitis, four cases; retinal edema, three cases.

Lidbetter and Nettleship, "In a pedigree showing both insanity and complicated eye disease,"² after describing choroidal disease, detached retina, lenticular opacities, and other ocular defects, conclude that there is an association between mental deficiency and ocular defects, partly developmental and partly morbid, amongst members of a family who are not known to have had any defined mental or bodily disease, but a large proportion of whom were not well enough endowed mentally and physically to compete successfully in life.

"The mental deficiency in this family tends to appear at an earlier age in each succeeding generation (anticipation); but anticipation cannot be proved for the ocular defects."

The fact that most of these cases were seen in the earlier stages of the disease may account for the high percentage of normal fundi observed, but several cases observed frequently during the year showed no change from one time to another. A well-defined intracranial affection may run its course for a long time without causing changes in the ophthalmoscopic picture, and even when a change is observed, it is often no index to the nature or extent of affections, as may be seen by comparing the first and fourth groups of this table.

	No. Cases	Normal Fundus	Papillitis	Retinitis	Low Grade Neuroretinitis	Hyalitis	Arterio-sclerosis	Central Choroiditis	Disseminated and Diffuse Choroiditis	Wassermann Blood Positive	Wassermann Cerebrospinal Fluid Positive
Alcoholism	7	3	1	2		1				2	
Del. Tremens..	1	1									
Toxic Del.....	3	1	2								
Morphinism ...	2	2									
Cerebral Syph.	5	1	1		2			1	1	5	2
Gen. Par.....	8	5		2	2			1		8	8
Art. Sclerosis..	8	1			2		4	2			
Br. Tumor.....	1		1	1							
Imbecile	1	1									
Epilepsy	4	3			1						
Dem. Pre. Par..	5	4	1		1						
Dem. Pre. Heb.	10	7	2	1							
Paranoid Cond.	4	1	1	2	1						
Man. Dep. Mix.	5	4			1						
Man. Dep. Man.	6	3	1	1	1					1	
Man. Dep. Dep.	20	6	2	2	3	3	3	2	1		
Presenile Psy..	2	1					1		1		
Hysteria	7	7									
Psycho. Person.	5	3		1					1		
Psychoneurosis	1						1				
Psychasthenia.	2	1		1							

CONCLUSIONS.

1. Well-defined disorders from extensive morbid conditions may exist for some time without change in the ophthalmoscopic appearance of the eye grounds.

2. Cases of dementia precox, either slowly developing or rapidly deteriorating, show no associated disc changes peculiar to this condition, but, on the other hand, show a higher percentage of normal fundi than either the organic or functional groups of psychosis.

3. In functional psychoses there is no definite association between the mental disorder and the ophthalmoscopic appearance of the eye ground.

The cases here presented were all referred from the psychopathic to the ophthalmic department in the University of Michigan, and I am indebted to Dr. Barrett and Dr. Parker for the privilege of reporting them. I wish also to express my gratitude to Dr. R. M. Haskell of the Psychopathic Hospital for many suggestions in the preparation of this study.

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IX.

A CASE OF SUDDEN BILATERAL BLINDNESS FOLLOWING A FIT OF ANGER, WITH RESULTANT PERMANENT BILATERAL CENTRAL (PARACENTRAL) SCOTOMATA.*

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On June 18, 1903, a young man, twenty-five years of age, strong, well built, and apparently in good health, consulted me on account of sudden blindness, which came on ten months previously. On a Saturday afternoon he got violently angry at his stepfather, who was maltreating his mother, without, however, coming to blows. About nine o'clock that night he commenced to get blind in both eyes. The following morning the same condition was present, and continued until Tuesday, when both eyes became worse; the right one totally blind, and the left one almost so. His family physician put leeches on both temples, and ice bags around his eyes; but as this appeared to do no good, he used "March snow" water. About six days after this he commenced to see better, until his sight was about the same as when I first saw him, June 18, 1903. His status at that time was the following: Right eye, 3/200; left eye, 6/200. Pupillary reactions direct, consensual and accommodative moderate; optic nerve heads dead white and slightly cupped; tension normal; arteries and veins normal in size and appearance; systolic murmur at base of heart; no Romberg symptom; good knee jerks; equal grip on both sides; no difference in mobility or sensation on either side in face, hands, or legs; slightly stippled appearance at macula.

On June 20, 1903, I received a letter from the patient's physician, Dr. A. Boyce Marion, in reply to one from me, inquiring as to the patient's condition, on or about the date of

*Read before the Section on Ophthalmology, New York Academy of Medicine, May, 1913.

the attack of blindness: "A. S. had no sugar in his urine, nor heart lesion last August, when I first saw him. He had, however, a large per cent of albumin in his urine at that time, but for the past four months none at all. I had a specialist see him at that time, who pronounced it retinitis. Prominent symptoms at beginning of attack were: rapid pulse, sighing respiration, and marked exophthalmus. He improved under saline cathartics and diuretics followed by iron."

At my request Dr. Van Horn Norrie examined the patient and stated his findings and opinion in the following letter, dated June 22, 1903: "I am much obliged to you for letting me examine A. S. The heart is enlarged, the apex is almost five inches from the median line, and from the right border two inches. There is a systolic murmur at the apex and also one over the aortic area. The aortic second sound is rather louder than it ought to be. There is moderate thickening of the radial arteries. The urine has a specific gravity of 1014; there is a faint trace of albumin, no sugar, no casts were found. I consider that the patient has a chronic diffuse nephritis. This would explain the size of his heart and the murmur."

He was treated for two months by increasing doses of strychnin until the physiologic effects of the drug were evident, but without improvement. Despairing of any further results, I handed him over to his family physician. In November, 1912, he appeared again at my office, about ten years after the onset of his blindness. He was evidently in the full vigor of health, strong, ruddy, spare and active. He said he was perfectly well, and had been in good general health ever since his last visit to me. I found that there was still a murmur at the apex and base of his heart, that his arterial tension was between 124 and 130; pulse 80, full and strong, but suggestive of tension. The report of his urine showed it to be without sugar and albumin, and was normal in all other respects. The condition of his eyes was about the same as before, except the fields had changed somewhat, particularly as to the size of the blind spot—as shown by chart, figure number 2. It will be observed that the scotomata are larger and very irregular in form, and that on this occasion, as formerly, the major part of each lies towards the temple, after the nature of a bitemporal central hemianopsia. It will also be observed, however, that each scotoma extended likewise past the median line, as

in the first field, figure 1, about ten degrees. The character of the general field likewise changed a little, as can be seen; is smaller than the normal, but a little more regular than the first. The hemianopsia, therefore, is entirely central, and the fields are simply the contracted fields of partial atrophy. The optic nerves were still dead white, veins and arteries of moderate size, within the normal; the stippled appearance at the macula had disappeared, and there were no changes in the rest of the fundus. I was unable to see any cupping of the nerve heads; pupillary reactions, all three moderate, as formerly. Right eye, vision fingers at three feet; left eye, vision fingers at two feet; excentric fixation in both. He is able to get about the streets with comfort and safety, can make figures and be fairly certain of them, and can sign his name, but he is unable to do any work that requires near vision.

Before entering into the discussion of the cause of the scotomata in this case, it is well to refer briefly to the position and course of the macular bundle of fibers in the retina, nerve, chiasm and tracts. These fibers have been traced in recent years by pathologic findings with such precision that they merit recognition as a distinct class and set, of themselves; they have not, however, been traced in the healthy nerve.

The macular fascicle originates in the macula lutea, and has been found to run first in the outer and inferior portion of the optic nerve; then it inclines toward the center so that when it enters the chiasm the fascicles of the two sides lie symmetrically in the two foci of the ellipse. In the chiasm they divide into the nasal portion, which crosses to the opposite side; and a lateral or outer portion, which continues its course unchanged into the tract of the corresponding side. In the tract the two sets unite and are found to form a single bundle in its center. In view of the crossing of the inner fibers, each passing through a focus of the chiasm, their position just at the moment of uniting with the lateral ones of the tract must be superficial. This assumption as to the superficial position of the cross fibers, as will be shown later, is consistent with the character of the scotomata.

Let us look for a moment at the conditions which might possibly cause such a bilateral central scotoma. A simultaneous bilateral retinal embolism, partial or complete, might possibly produce it; but in the case of a complete one the re-

sultant scotomata would have been far more extensive and the field much different. A partial one, occurring at the same time on both sides and approximately in the same locality, might conceivably have caused it, but the law of probabilities excludes this completely. A simultaneous bilateral hemorrhage within the optic nerve fibers is to be excluded on the same ground. A hemorrhage at the base of the brain may be excluded by reason of the absence of any other symptom of this condition, such as coma, and the paralysis, temporary or partial, of any other cranial or ocular nerves.

It is obviously impossible to place the lesion on either side

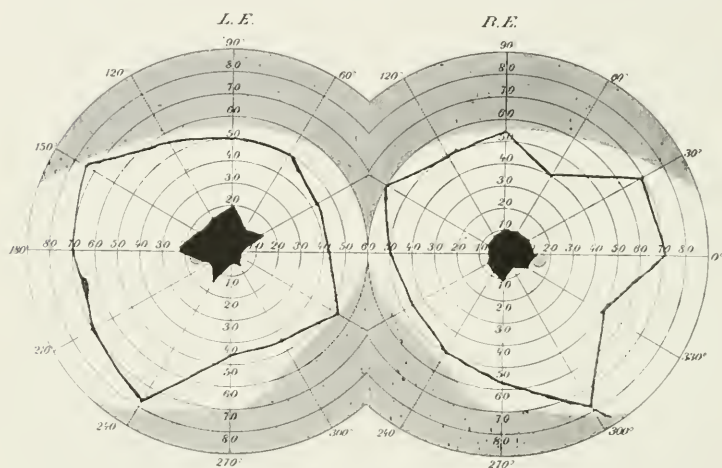


FIGURE 1.

A. S., June 22, 1903.

of the brain, in the cortex, or at any point between the cortex and the place where the tracts enter into the substance of the brain. Any scotomata that betake largely, as these do, of the bitemporal character, could not possibly have their origin on one side alone. The location for the lesion must be sought at some point where the pressure can be made upon each set of nasal fibers; this of course can be accomplished only at one spot—just posterior to the chiasm in the crotch formed by the divergent tracts. It seems, therefore, highly probable and reasonably certain that the scotomata in this case was caused by pressure upon the tracts of each side, as they emerge from

the chiasm, by the swollen and distended anterior lobe of the apophysis.

Reference to the anatomy of this ductless gland is apropos. "Formerly thought to be a vestigial, functionless structure derived wholly from the brain, the investigations by Rathke in 1838, and Gotte, Balfour, and Mihalkovitch in 1874 and 1875, have shown that it consists of two parts—an anterior or epithelial portion, consisting of a closed sac, the hypophyseal sac, apparently wholly formed from the embryonic buccal cavity by an invagination (Rathke's pouch), and therefore of ectodermic origin; and the posterior lobe derived from the

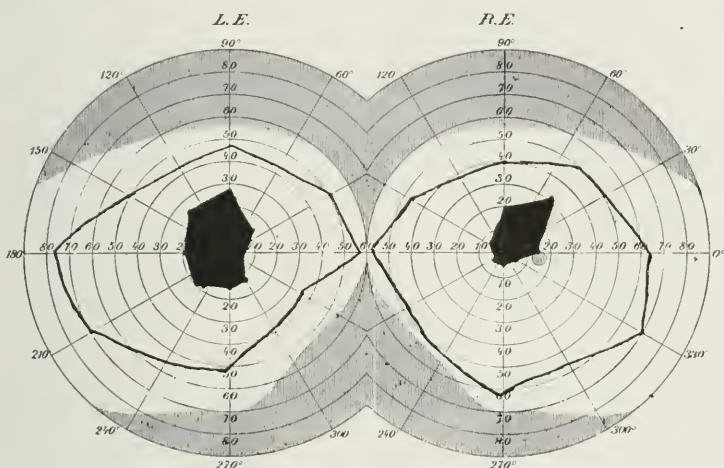


FIGURE 2.

A. S., November 27, 1912.

upper portion of Rathke's pouch, and a downward fold from the anterior cerebral vesicle and the infundibulum, with which it has become adherent. This posterior lobe or neural portion is covered by an epithelial extension from the anterior lobe and is but slightly vascular; the anterior lobe, on the other hand, is excessively vascular, its blood supply being apparently supplied, especially in the dog, through the infundibular stalk."¹

It is well known that in anger there is congestion of the face and neck, and doubtless likewise of the base of the brain. The patient described his anger as very violent. There prob-

ably was intense congestion, more or less continued, or hemorrhage, or a combination of both, in the vascular anterior lobe of the apophysis—the resultant swelling causing pressure upon the crotch of the chiasm where we have assumed the macula fibers lie, more or less superficial, as they pursue their course in the tracts. At the same time it might have pressed to some extent upon the outer temporal fibers: this would account for the fact that whereas the scotomata are mostly bitemporal, they pass also slightly beyond the median line. It is extraordinary that in view of this pressure there was no general bitemporal character to the fields.

Marlow² also reports a case of disease of the hypophysis in which the fields and scotoma for white considerably resemble those found in this case. In his case the field in the left eye shows a scotoma largely temporal, but passing also a few degrees beyond the vertical line, whereas in the right eye it was much smaller, lying entirely on the temporal side. The extent and character of the fields in his case is very similar to those in this. The fields in his case, however, changed extensively six months later.

The assumed lesion is entirely consistent with the history. It will be remembered that the patient became violently angry in the afternoon and commenced to get blind in both eyes about nine o'clock. This continued until Tuesday, the third day, when the right eye became totally blind and the left almost so. At the end of five or six days he improved somewhat and subsequently was able to get about, and he states his condition was at that time about the same as when I first saw him, ten months after the attack.

Emory Hill³ publishes two cases of hypophysis disease, but his cases are not similar to this one. He refers to the scotomata occurring in hypophysis disease, and states that they occur with comparative infrequency. Bartell records them in thirteen per cent of twenty-two cases; v. Frankel-Hockwart, one in thirty-one cases; Uhthoff mentions central scotoma three times in 328 cases; de Schweinitz and Holloway present the following classification of scotomata in hypophysis disease:

1. Small and paracentral scotomata.
2. A quadrant up and out.
3. Scotomata varying in size and position.
4. Bitemporal hemianopic scotomata.

5. Scotomata in the temporal field at some distance from the fixation point.

6. Blurred vision, unexplained by any ophthalmoscopic lesion.

Knapp⁴ quotes Henschen, showing the typical course of the visual disturbances in hypophysis disease, as follows: "Pressure on the ventral macular crossing fibers produces small macular or perimacular bitemporal scotomata upward; then pressure on the crossing ventral peripheric fibers results in bitemporal quadrant hemianopsia. Additional pressure then involves the uncrossed fibers, and one eye is blind, with temporal hemianopsia in the other, or both eyes are blind. Sometimes the color fields are first involved, especially in the upper temporal quadrant. In general, the development of the field defect is irregular and not as stated above, and very different combinations of visual disturbances are observed."

The scotomata shown in this case are seen to be consistent with those found by others in hypophysis disease. Although there were no other symptoms of hypophyseal disease, the explanation given for the scotomata in this case seems to be the only reasonable one. The case appears to be unique.

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X.

EYE STRAIN AND OCULAR DISCOMFORT FROM FAULTY ILLUMINATION.

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EYE STRAIN FROM FAULTY ILLUMINATION.

Problems of illumination involve a consideration of three factors: Hygiene, esthetics, and economy. I mention these in their order of importance, and so place hygiene first. Much work has been done and is being done by engineers, manufacturers and inventors, but for obvious reasons they have reversed the order and have made economy their first aim—the production of more and cheaper light. Only lately have they given attention to beauty and artistic effects in lighting, as distinguished from beauty and artistic effects in fixtures. Still less attention have they paid to hygiene; and I regret to say that they are little to blame, for they have appealed in vain to us for an accurate, complete, systematic treatment of this part of the problem. While I have tried to make what I have written accurate, I am not foolish enough to think I have avoided all errors, and in view of the importance of the subject and the need of reliable information, I beg of you to let no erroneous or doubtful statements pass unchallenged.

At the Seventeenth International Congress of Medicine, held two months ago in London, one of the few topics set for discussion before the Ophthalmic Section was: "The affections of the eye produced by undue exposure to light." Reports were made by J. Herbert Parsons and Carl von Hess.

Both reports considered eclipse blindness, snow blindness, electric ophthalmia, glass workers' cataract, and similar diseases. No important new facts or theories were brought forward concerning this group of affections. They agreed that the ultraviolet radiations cause ophthalmia electrica and snow

blindness, the lesions being superficial. That the intense visible and infrared rays (often called heat rays, though all rays, infrared, visible and ultraviolet, are convertible into heat) cause eclipse blindness, the chief lesions being retinal. That exposure to intense artificial light can cause both the ultraviolet and the heat effects, the former producing superficial lesions of the cornea, conjunctiva, and, if very intense, of the lens, and, according to Birch-Hirschfeld, of the retina, though no others have corroborated this, and recent experiments in Boston make it doubtful; and the latter producing retinal lesions, and, if very intense, corneal and lenticular. Radiations affect only those tissues by which they are absorbed, not those by which they are transmitted. Thus the ultraviolet rays which are absorbed so quickly exert their baneful influence on the superficial tissues which absorb them, and do not harm the retina, because they fail to reach it in sufficient quantity. On the other hand, the visible and infrared rays are absorbed in such small degree by the cornea and lens, which are transparent to them, that they cannot injure these tissues unless they are present in truly blistering intensity, but are passed on to be absorbed by the retina, where, therefore, their chief effects are felt.

In addition to these topics, dealt with by both writers, Parsons called attention to some matters concerned with the physics of light, and Hess called attention to the slender basis on which current views about photophobia rest, and ventured the assertion that daylight of ordinary intensity is incapable of directly harming either the sound eye or the diseased eye, including not only superficial diseases like phlyctenular inflammation, but parenchymatous keratitis, iritis, choroiditis and even retinitis.

Thus these two writers dealt with the pathologic lesions, inflammatory and the like, produced by radiations of an intensity far exceeding those ordinarily worked with. They mentioned the effects of working with lights under ordinary conditions, only to point out that there was no danger of photophthalmia* or other similar effects under these conditions. Is it not worth while to call attention to the fact that these matters of eclipse blindness, snow blindness, electric ophthalmia, glass workers'

*A convenient word coined by Parsons to include the inflammations caused by exposure of the eye to intense radiations.

cataract, interesting and important as they are, are really less important in everyday practice and, as I believe, in scientific interest, than the less striking and dramatic, but infinitely more numerous, cases of ocular discomfort and loss of efficiency due to working under improper methods of illumination with lights of ordinary intensity?

Under ocular discomfort I include the usual symptoms which come on when one reads or works with unsatisfactory light—that is, one whose eyes are sufficiently sensitive or vulnerable. Some can work or read without discomfort under conditions which are intolerable to others, reading for hours on moving cars, or with glaring lights, or with too dim light; just as some can tolerate uncorrected or imperfectly corrected hypermetropia or astigmatism or ill adjusted glasses. I am fond of comparing this problem with that of the digestibility of various articles of food. Test them on a man with a good, strong, healthy digestion, and you find no discomfort following a meal which would half kill a person with weak, defective, vulnerable digestion. To find out what things are hard to digest you must make your tests on persons who are susceptible, not on those who are tough and insensitive. The same principle applies to the eyes. To take the opinions of strong, healthy men working in a shop or other workroom on the question whether a given method of lighting is trying to the eyes will not be fertile in profitable answers; few if any will have complaints to make of methods of lighting which might soon produce great discomfort and disability in persons with sensitive eyes, and with no motive to conceal unfavorable effects.

The symptoms of ocular discomfort may be classed under three heads: (1) Sandiness, a conjunctival sensation. It includes hot, itchy, scratchy, dry feelings. (2) Tired, aching, painful feelings in the eyeball and often in the head. (3) Blurring. For an excellent account of these symptoms see Black and Vaughn, *Journal American Medical Association*, September, 1913.

The loss of efficiency is due to the blurring and the inability of the eye to respond to the (for it) excessive demands made upon it to adapt itself to unfavorable conditions. It may amount to total disability to use the eyes or merely to inability

to accomplish as large an amount of work as could be done under favorable conditions.

When we try to analyze the problem of how imperfect illumination can cause these symptoms, there are just three factors to consider: the quantity, the quality, and the distribution of the light.

(1) Quantity.—On the question of quantity or intensity of light as affecting seeing, very important fundamental work was done long ago, and the law known as Fechner's law established. If we look at a picture or scene of which the various parts present a wide range of light and shade with many gradations, the distinctness with which the details or parts of the picture are seen does not change whether we view them with strong or weak illumination within a rather wide range. This is because the eye can adapt itself to a very wide range of intensity of illumination. Within this range differences in the intensity of light appear equal in sensation if they form an equal fraction of the total quantity of light compared. This is true of other senses besides the sense of light. For example, in comparing the weights of objects, if we can distinguish between 10 and 11 ounces, we shall also distinguish between 20 and 22 ounces, 50 and 55 ounces, 100 and 110 ounces. In each case the second is the same fraction heavier than the first, viz., 10 per cent. So with light; if we distinguish the brightness difference between two adjacent surfaces when the light of one equals 100 units and of the other 101 units, we could as well distinguish if one equaled 200 and the other 202 units, or one 1000 and the other 1010, in each case the difference being 1 per cent. Only when the intensity of illumination is reduced below a rather small minimum or increased above a rather high maximum, does this law fail. While we can see by the light of the full moon or by the light of the midday tropical sun, these extremes are beyond the range for which the law holds good. They show how far we must go to reach an intensity to which the eye does not adapt itself.

However, when we consider the capacity of the eye not simply to see, but to see comfortably and work efficiently, the range is much less extensive. It is found to depend on various other factors which we shall soon take up. But with a light of suitable quality properly diffused and distributed, the intensity can vary widely without impairing the comfort of

the eye or its efficiency: when the lighting does not fulfill those conditions of distribution and quality, the eye can work with comfort and efficiency over a very much narrower range of intensity, if at all. There are many applications of this principle. Suppose, for example, we have to light a room in which many must work. It is impracticable to have exactly the same intensity of illumination in all parts of the room, but if quality and distribution are properly cared for, the differences in intensity will not, within a considerable range, matter at all, either as regards comfort or efficiency.

It is perfectly obvious that working with too dim a light will cause ocular discomfort. So will working with too strong a light: and that is getting to be the more common of the two since more and more cheap and efficient sources of light are devised. These facts are so obvious that we need not tarry to discuss them further. Many violate the laws of hygiene by working with too little or too much light, but it is usually through carelessness, not ignorance.

From an engineering point of view quantity and intensity are very important and have received much attention, for the obvious reason that on them depends so largely the question of cost, but that is outside our present discussion.

The mechanism by which the eye provides for changes in the intensity of illumination is a twofold one: first by controlling the amount of light that enters the eye, and second by the process of retinal adaptation. The iris by varying the size of the pupil, the lids by closing more or less, and the brows and accessory parts by further shading the eyes, all regulate the amount of light entering the eye and do it rather promptly—in the fraction of a second. The action of the pupil is wholly automatic, that of the lids and brows partly automatic and partly under control of the will.

Frequent changes in intensity, such as we get with a flickering light, are not well borne and quickly cause discomfort. The eyes vainly try to accomplish an effective and stable adjustment which will secure a steady flux of light into the eye, and the futile but persistent automatic efforts to do this cause discomfort very quickly and surely. Less frequent changes can be followed and taken care of by the adjusting mechanism, but it is doubtful if the process ever is, as suggested by Black and Vaughan, a restful one. Most of us will

agree that a steady light is more restful than a fluctuating one, even if the fluctuations are slow and gradual.

It is important to remember that not all of the retina is capable of causing these adjustments of the pupil to changes of light intensity. Only the macular region and the immediately adjacent parts of the retina within a radius of less than 5 mm., perhaps less than 3 mm., have much, if any, activity of this sort. The pupil, lids, etc., provide for more or less sudden changes in the intensity of the light, but gradually, as retinal adaptation takes place, the pupil tends to return to its previous average size.

The process of retinal adaptation is a physicochemical one. The shape of the cells, the distribution of the pigment, the quantity and distribution of the visual purple, and perhaps other similar substances, are features of the process. There is no reason to believe that ocular discomfort is dependent in any direct way on the visual purple, as has been suggested by some. The rods are specially fitted for seeing in dim lights, and the cones for lights like daylight and artificial lights of comfortable intensity. Therefore, the peripheral parts of the retina are dark adapted, since here the rods greatly outnumber the cones, while the reverse is true of the macula, where the cones outnumber the rods ten to one. It is of interest to remember that the actual intensity at the retina is about one-twenty-fifth the illumination of the object looked at, varying with the size of the pupil.

We may sum up the matter of intensity or quantity of light by saying that while it is of great importance from many points of view, and while too little or too much light causes ocular discomfort and loss of efficiency, yet the necessity of regulating the intensity is so obvious, and the eye is so capable of adapting itself to different amounts of light, that the factor of quantity is not at the present time of great importance in studying the problem of ocular discomfort.

When we ask what effect quality of light has in causing ocular discomfort, we simply raise the question, does the wave length of radiations, for that is what we mean by quality, make a difference to the eye? Now the striking differences in the properties of radiation are just those that depend on wave length, viz., visibility, color, chemical effects, heat; so that it is evident that the wave length is a very important fac-

tor to consider. Without going into the interesting subject of the properties of different wave lengths in general, we must limit ourselves to their effects in causing ocular discomfort.

There are three things to consider: The influence of infra-red, ultraviolet, and visible rays. When the rays strike a body they are either transmitted or absorbed. Those that are transmitted produce no effect on the body transmitting them; those that are absorbed are converted into some other form of energy. Any form of energy when destroyed gives rise to an exactly equivalent amount of some other form of energy. If we interpose in the path of radiating energy, such as ultraviolet rays, a body which does not transmit but intercepts most of them, for example the cornea, they are transformed into some other form of energy and the cornea suffers damage. In this case the energy takes some chemic, physiologic form, causing necrosis; but the striking feature is that the injurious effects are retarded, not appearing until several hours after exposure.

In the case of infrared rays, since the cornea transmits most of them it is not easily damaged by them. Some are arrested and absorbed in the lens, many in the aqueous and vitreous, but no damage is done unless the amount of energy transformed is very great. The form it takes is heat, and it is possible to burn the cornea and lens by sufficiently intense heat. But most of these rays are not arrested until they reach the retina which, therefore, is the part of the eye chiefly damaged by them.

In the case of visible rays, they too, when arrested, are chiefly transformed into heat, and so affect the retina if they make it hot enough. But to some extent the visible rays, especially towards the shorter wave lengths (blue and violet), have a similar action to the ultraviolet rays, and so can contribute a small share toward the peculiar damage done by those rays.

What I wish to emphasize is that it is a far cry from all these harmful effects produced by intense radiations to the question of ocular discomfort produced by working under ordinary conditions of illumination. There is, in the opinion of most writers, no question of any such direct action of the radiating energy on the tissues. The mischief is of an entirely different order. What its nature is we shall discuss a little later.

Another more vexed question is whether the differences in color, i. e., wave length, of the light within the visible range of the spectrum, are a factor in causing ocular discomfort. Thus, is a yellowish light better than a whiter or a greener light, etc.; or if a Welsbach light is objectionable, is it because of its quality or for some other reason? Is the Cooper-Hewitt mercury vapor lamp harmful because of its color? Is the light of the kerosene student lamp so agreeable because of its yellow color? We cannot answer these questions with absolute positiveness at present. Those who believe that color is an important factor have failed to prove their case. Perhaps they overlook other more weighty reasons. For myself I am somewhat undecided, but lean toward the opinion that color is an unimportant factor if all other conditions are favorable. I am sure that in some of the cases where trouble has been attributed to the color, other factors of more importance have not been eliminated. Still I believe that the eye has preferences in the matter of color, and so if I were selecting a light to be as perfect as possible, I should be careful about the color, but I should be far more careful about other factors. Probably I should be guided in the matter of color by esthetic considerations more than directly physiologic ones. Thus I do not agree with Black and Vaughn, who proposed, at the Minnesota meeting of the American Medical Association, the hypothesis that the reason artificial illumination causes ocular discomfort is because the eye has not been fitted by the process of evolution to tolerate light which differs from daylight by containing a very different proportion of infrared rays, only a small part of the total energy radiated by ordinary artificial sources of light being of the wave lengths which are useful for seeing. They further suggest that the retinal purple has something to do with this.

With this very brief reference to some of the considerations involved in the question of quantity and quality of light, let us pass to the third factor—distribution. As has been said, quantity is important, but fairly well understood and easily controlled. Quality or wave length is of importance esthetically and on grounds of efficiency, but has not been proved to be of importance as a factor in causing eye strain. Practically all writers agree that distribution is of very great importance as a factor in causing ocular discomfort and loss of efficiency

under ordinary working conditions. When we speak of distribution as a factor in this problem, we include several subdivisions, namely, direction, intrinsic brilliancy, diffuseness, shadows, flicker.

Under direction the following points deserve emphasis: no brilliant light source should be located so that it is visible; that is, shines into the eye when looking in the usual directions. All are agreed that an exposed light shining into the eye is a source of discomfort, the only disagreement is as to what directions are the worst. All agree that a light from below is worse than from above; for example, light reflected up from the water or snow is worse than down from the sky or from the horizontal.

Second, light should not come from such a direction that it causes glare by reflection from the paper or work we are looking at.

Third, light should not be so located as to cause troublesome shadows—for example, when writing, the hand should not shade the point of the pen.

These three points are covered by the old recommendation, have the light behind and over the left shoulder.

Intrinsic brilliancy: this is a useful term. It makes a great difference whether the amount of light in a room comes from a small source of great intensity—high intrinsic brilliancy, for example, a bare arc; or a large source of low intrinsic brilliancy, for example, a large window by daylight or a brightly lighted ceiling by the indirect method. We must learn to think of the ceiling, walls, etc., as the sources of light; not, of course, the primary sources, but the immediate sources from which the light comes which falls on our work. When the sun shines in a window, if we draw down a white shade, the shade becomes the source of light for the room. Before that, the bright area on the floor, directly lighted by the sun, was one source; the buildings and sky, etc., visible through the window, the other sources. Only for the small part of the room where the sun was directly visible was it the immediate source of light.

Another important thing to bear in mind is that it is the light which comes from the object we are looking at (book, wall, desk, etc.) that concerns our eyes. If we carefully shade the side of our heads from a glaring light, but let it fall un-

shaded on the book whence it comes to our eyes, we are not doing enough. The light on the work should be studiously considered and made right. Now a light of high intrinsic brilliancy is of course bad to look at, and should never, in good lighting practice, be left exposed so that it can shine in anybody's eyes; but that in my opinion is not enough. I believe that the effect of reading with light from a source of high intrinsic brilliancy, and therefore relatively small size, shining on the paper, is to contribute to ocular discomfort. Of course it will do so if located so as to cause a glare by specular* reflection from the paper. But even when that is avoided, I believe a source of high intrinsic brilliancy is a factor in causing ocular discomfort.

I have for years used a simple device for patients to test this in their homes or offices. Without trying to explain to them what we mean by high intrinsic brilliancy, I tell them to hold a pencil parallel to and three inches from their book or paper, and observe the shadow. If it is daylight from a window the shadow will be blurred; if it is light from a small concentrated source the shadow will be sharp. I tell them if the shadow is sharp and intense the light is not a soft, agreeable, comfortable one to work by. Such a light will cause a glare, if the paper is at all shiny. For glare from reflection is simply the blurry image of the source of light reflected into the eye. Now, if the source is not bright and intense, of course its image will not be; so glare can be avoided by avoiding sources of high intrinsic brilliancy. But I repeat that, even apart from glare, I believe a source of high intrinsic brilliancy, which casts a sharp shadow, is an uncomfortable one to work by.

Lastly we must consider diffuseness as a subdivision of the distribution of light. Diffuse light is the opposite of directed light; it comes from many directions instead of one. If perfectly diffused it would come from all directions equally. Of course, there are no sharp shadows with diffuse light, because a shadow is a place where light does not fall, and if it comes from all directions, there is no place it does not reach. If the light is only moderately diffused, we get shaded areas as distinguished from shadows; that is, areas where somewhat less light falls. Sometimes we want no shadows—for example,

*Like a mirror or shiny surface.

when draughting, or dissecting, or operating—for the shadow would obscure what we are looking at. With dense shadows we are straining to see what is in the shadow. A sharp edged shadow may be confused with the edge of the object. Sometimes we do want shadows, because without them objects stand out less distinctly. We want sufficient directed light to mark the edges of objects and improve definition. Especially are shadows helpful when there is a lack of color differences. Absence of shadows means a flat, uninteresting effect; so for esthetic reasons we want sufficient directed light to make some shadows. Nothing stands out with especial prominence in a diffuse light; so when we want to accentuate some feature, call attention to anything like goods displayed to attract a purchaser, we need directed light to mark the contrast and make the object stand out and attract attention.

One advantage of diffuse lighting is that it permits a larger pupil, thus admitting more light into the eye, and so making a lower general illumination suffice for good, comfortable seeing. With some patients, such as undercorrected presbyopes, a small pupil gives better vision, because a sharper image (smaller diffusion circles on the retina); these prefer brighter lighting.

From the above it should be clear that well-diffused light is better for most purposes, but that it is wise in some cases to add some directed light. The usual way to get diffused light is to use a large area of moderate or low intrinsic brilliancy as the source; for example, the ceiling or walls, or both. This is done by indirect lighting of various forms, and is one reason why indirect lighting is so much better than the old way for many purposes. Another reason is that there are no exposed visible light sources. It cannot be too often reiterated that bare, exposed, intense sources should not be tolerated in good lighting practice. The pathologists may assert that no changes in the retina can be detected from exposure to such light, but there are two other things to consider. One is that exposure, night after night, to such sources of high intrinsic brilliancy may so reduce the resistance of the tissues as to make them more vulnerable to other damaging agents. The other is that the tax on the adjusting mechanism of the eye causes eye strain, which, though unaccompanied by any histologic changes, is none the less a very real and important

thing for ophthalmologists to consider. This brings us to the somewhat puzzling question—

HOW OCULAR DISCOMFORT IS PRODUCED BY FAULTY
ILLUMINATION.

Obviously this is a fundamentally important question for us as ophthalmologists. What hypotheses have been suggested? By common consent all writers on the subject seem to admit that the sensations of pain, as well as the tired, blurry feelings, are of muscular origin—have their source in the intra- or extraocular muscles. As to the other sensations, which I grouped as conjunctival, there is no general agreement as to how they are produced. It is evident that their seat is in the conjunctiva, and I think we may safely say that most of the symptoms in this group can be explained on the basis of hyperemia of the conjunctiva. The question is, how hyperemia is produced. I have tried to take the various suggestions proposed and unify them into a consistent and convincing hypothesis. I have utilized the little that I have found in the literature, and made free use of what I have learned or had suggested to me in conversation with numerous colleagues, to whom I am duly grateful, though, as is often the case, one cannot trace the source from which each idea had its origin. I have not succeeded in finding out who first suggested that the sensation of pain caused by exposure to faulty illumination was of muscular origin. Magendie in 1824 showed that the retina was insensitive to pain. It was an easy step to the conclusion that the pain was felt through the trigeminal nerve; but that the muscles were the primary occasion of the disagreeable feelings is not so obvious, and who pointed it out I should very much like to know.

In attempting to formulate a comprehensive theory about it, the first thing is to have a clear idea of what we want to explain. We have three groups of symptoms: First, the local hyperemia of the conjunctiva, and consequent redness and dry, hot, scratchy feelings; second, blurring which comes and goes; third, the various forms of pain, dull, aching feelings, sharp darting stabs, sleepiness, difficulty in keeping the eyes open, etc., and lastly the headaches of various sorts. The next thing is to eliminate such factors as we can. I think we can safely exclude any direct action of the light as light, or

radiation as radiation. The harmful effects produced by these agents are entirely different in character, as stated above. The next thing I would call attention to is the striking similarity of the symptoms arising from eye strain due to faulty illumination, to the symptoms of eye strain arising from working with uncorrected errors of refraction. This similarity of symptoms is certainly a hint to look for a common or related cause. Now the cause of eye strain due to errors of refraction is fatigue and exhaustion of the muscular and nervous control of the mechanical adjustment of the eye. All the above named symptoms can be explained by (a) hyperemia of the conjunctiva and other parts of the eye; (b) fatigue of the ocular muscles concerned in mechanical adjustments of the eye.

The adjusting mechanism of the eye is a threefold one: First, the adjustment for intensity of light (lids, etc., pupil, retinal adaptation); second, for the distance of objects (focusing or accommodation); third, for the position of objects (fixation and convergence). The suggestion is obvious that the way faulty illumination affects the eye is through the mechanism of adjustment for intensity of light. But we have already said that intensity is not an important factor. The mechanism for adjusting the eye to intensity is so automatic and smoothly working that we have little trouble from its derangement in ordinary cases. Only in such unusual conditions as albinism, retinitis pigmentosa, hemeralopia, and the like, does this mechanism break down. There is one exception to this. The periphery of the retina lacks the mechanism of adjustment; it can neither regulate the amount of light by controlling the pupil, since that appears to be the exclusive function of the central retinal region, nor can it adapt itself to the changes of light by the mechanism of retinal adaptation, since the periphery of the retina is perpetually dark adapted, owing to the lack of cones and predominance of rods. Here we have a clue to the way a strong light falling obliquely on the eye and so striking the periphery of the retina causes ocular discomfort. This part of the retina does not tolerate such light well, because it has no adequate mechanism to adjust itself to varying intensities of light. The dark adapted area being exposed to strong light, there ensues a hyperemia of the retina and choroïd, and if the process continues there follows a hyperemia

of the conjunctiva and of other parts of the eye. Hyperemia of the conjunctiva will explain the symptoms in its group; hyperemia of the ciliary region will throw light on the other groups.

Another factor, which has been suggested by Ferree, is this: When a bright light strikes the periphery of the retina, the first and fundamental impulse is for the eye to turn and fix it. Now this impulse has to be inhibited. Thus the muscles are stimulated by the impulse to fix, for it is a fundamental law that even when an impulse is held in check so that no motion appears to the observer, a stimulus is sent through the motor nerves. This has to be held in check by a counter stimulus. This is fatiguing to the muscles, and so causes: (a) hyperemia and its train of symptoms; and (b) fatigue of the muscles and its train of symptoms.

We can discuss the various factors of distribution as well as those of quality and of insufficient intensity together. Any fault of illumination results in producing unsatisfactory retinal images—too faint, too bright, of objectionable color, blurry; in short, they interfere with easy and quick perception of what we are looking at. Result, increased efforts on the part of the eye to secure better images on the retina: that is, more sharply focused, more accurately fixed on the fovea, more satisfactory in brightness. These effects mean whipping up the ciliary muscle to more perfect focusing, the fixation muscles to more perfect fixation and convergence, the iris to more satisfactory adjustment for quantity of light. As a result they are fatigued. The reparative anabolic processes in the muscles go on at the same time with the processes of breaking down which accompany muscular activity. Under favorable working conditions the building up does not lag far enough behind the breaking down to cause uncomfortable sensations (fatigue, etc.). But let a little greater demand be made and the margin of safety, of reserve, is past, and fatigue follows; thus it is easy to see how working the muscles of the eye a little harder will produce symptoms of discomfort, although the work is quite physiologic and such as the muscles are made for. It also explains why some will feel the symptoms and others will not—the margin of safety of the latter is greater, their anabolic processes keep ahead of their katabolic, they do not spend beyond their income, and so they avoid the discom-

fort which is sure to follow. If we regard fatigue as a matter of toxin and antitoxin, the comparison will still hold good.

Now it may be thought that when we read or work we are focusing and fixing the objects we are looking at; and to speak of the eyes making efforts to focus and fix better—more sharply and accurately—is rather drawing on the imagination, is a figure of speech, and a rather vague way of trying to explain the facts. Not at all. When we read a book under favorable conditions, we do not by any means focus and fix each word, far less each letter of the line, as our eyes pass quickly and jerkily across the page. We take it in without the need of any such accurate and painstaking process. Now let the conditions be made unfavorable, the images on the retina are too unsatisfactory, and the eye strains to compensate. It matters not whether the cause of the unsatisfactory image is ametropia, dim light, glare, flicker, a shadow thrown across the page, a light shining into the eye, whatever it is, the eye tries to improve the image so that the perceiving of what is being looked at will be easier and more satisfactory. Consider particularly fixation as an example. We do not as a rule fix so accurately as to throw the image just on the center of the fovea. This is proved by the action of after-images. Fix a bright object of moderate size, such as a gas flame in a dark room, then extinguish the light and observe the after-image.* It will almost invariably be found to move. That is because the image is not centered on the fovea. By the direction the after-image moves you can tell whether you looked a little below or to the right or left or above the center, because the image will move up, to the left, right or down, as the case may be. Experiments of great sensitiveness can be made with after-images to show how the eyes move about when they are supposed to be fixing a definite point and are trying hard to do so. In the case of accommodation it is probable that the eyes do not, under ordinarily favorable conditions, make the most sharp and precise images on the retina of which they are capable, and so can be whipped up to more perfect work when occasion arises, but at the expense of much greater fatigue.

This, then, is my explanation of the eye strain from faulty illumination. We are able to see well enough for ordinary conditions without exerting our maximum nicety of adjust-

*Ferree.

ment. But let conditions become unfavorable, and the eye tries to make up for that by more perfectly adjusting all parts of the mechanism which can contribute to better seeing. Hence the symptoms of eye strain from faulty illumination are so like those of uncorrected errors of refraction and the like. Compare the effects of trying to read on a moving train with the effects of a flickering light. In the first case, in order to follow the irregularly moving page, we have to fix and focus the lines, the words, and even the letters with a far greater degree of accuracy of adjustment. The strain is obvious on the adjusting mechanism and on the attention. Similarly with the second case, that of flickering light; the eye tries to compensate for the wavering, varying intensity of an adjustment which will give a steady flux of light into the eye; also, being unable to do this though still automatically keeping up the attempt, a tax is put on the perceiving part of the mechanism, the image being a varying one, the brightness of an area is no sooner perceived than it changes to the brightness of an adjacent area, which an instant before presented a contrast. It must be remembered that the eye is normally shifting its fixation almost incessantly, so that in fact it requires great effort not to do so, but to fix steadily a given point. When we look at a page or a picture, a room or a landscape, or even a face, the eyes move rapidly from point to point, exploring it, and mentally recording the impressions of the various parts and constructing an idea of the whole. Now if the parts do not preserve any steady relative values of brightness, a chaotic condition results, and to make something satisfactory out of it the eyes try to get a better image of each momentarily fixed spot, try to flit more rapidly and fix more precisely, and, in short, struggle to overcome a handicap in these and other ways. Examples applying the principle to glare and other faulty conditions could be cited, but I have given enough to show what my theory is.

Now a word as to practical application—I shall not cite cases, but hope some of you may do so.

There is a class of patients with symptoms which point unmistakably to eye strain, whose refraction we have gone over with the greatest care, but in vain. Perhaps finally we have to order a rest as the only way to relieve them. Let me suggest that before doing so you investigate the conditions of

lighting under which they work. See to it that there are no exposed visible sources of light of high intrinsic brilliancy to shine into their eyes or to make glare by reflection from desk, paper or other objects. See to it that the light comes from the right direction, that it is sufficiently diffused; try the simple test of observing the shadow cast by a pencil held three inches from the paper. If they have colors to discriminate in their work, see to it that the lighting is of proper quality to make this easy. Do not hesitate to advise improved methods of lighting, because they may cost more. The facts are that it will cost little more, if properly designed, and will earn much in efficiency and comfort.

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XI.

OCULAR SYMPTOMS ASSOCIATED WITH OXYCEPHALUS OR TOUR SKULL.

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OMAHA.

Although oxycephalus is not a condition which primarily claims the attention of the oculist, yet grave ocular changes are so frequently associated with this deformity that they have been given special prominence in the literature, and are usually the determining factor influencing the patient to seek medical assistance.

Over half a century ago Mackenzie¹ recognized a definite relation between certain forms of what he calls chronic hydrocephalus and ocular disturbances. He calls special attention to the depression of the orbital roof, the shallow orbits, the exophthalmus and visual disturbances. Cases have been observed and reported from time and time, and a great deal has been done toward clearing the rather obscure etiology and pathology. The X-ray has been of great assistance and should be, if possible, employed in the study of these deformities.

I wish to report three cases which I have seen recently, in one of which there was, so far as I have been able to learn, a previously unreported condition, and it was for the correction of this that he consulted us.

Through the courtesy of Dr. George Mogridge, superintendent of the Iowa State Institute for Feeble Minded Children, I had the privilege of observing two cases, which, while not presenting the condition above mentioned, show some of the usual features associated with this cranial deformity, and are briefly as follows:

Case 1.—Florence R., aged nine years. Family history negative. Skull rather narrow. Vertex moderately high and almost converging to a point at the high, slightly receding forehead. The face was somewhat flattened. There was exoph-

thalmos of 5 to 7 mm. with a left convergent squint of 10 to 15 degrees (estimated). The media were clear, but there was a low grade retinal irritation with some distension of the vessels. The discs were slightly blurred and a trifle elevated. Owing to the low mentality I was unable to measure the visual acuity or fields, but the attendants had noticed that her vision was much reduced. I was unable to make an X-ray examination of this case.

Case 2.—Etta A., aged thirteen years, of about normal height but very fat, with a possible tendency toward infantilism, and



FIGURE 1.

Case No. 1. Shows receding peaked forehead and exophthalmos.

underdeveloped mentally. The cranial deformity is very marked, the portion anterior to the position of the anterior fontanel being decidedly elevated. The forehead is high but not of the hydrocephalic type. The face is flattened. The lower jaw is prominent with some distortion of the teeth. The palatal arch is very high. Nasopharynx about normal. Slight deviation of the septum, but no other intranasal pathology. The bridge of the nose is not particularly depressed. The eyes are markedly proptosed, and there is a slight tendency to thickening and eversion of the left lower lid. There is no squint or

nystagmus. The ophthalmoscope shows the media normal. Slight retinal disturbance, with complete optic atrophy and no light perception. The radiograph shows a thinning of the bones of the cranial vault, with displacement forward of the sella and depression of the orbital roofs. The early history

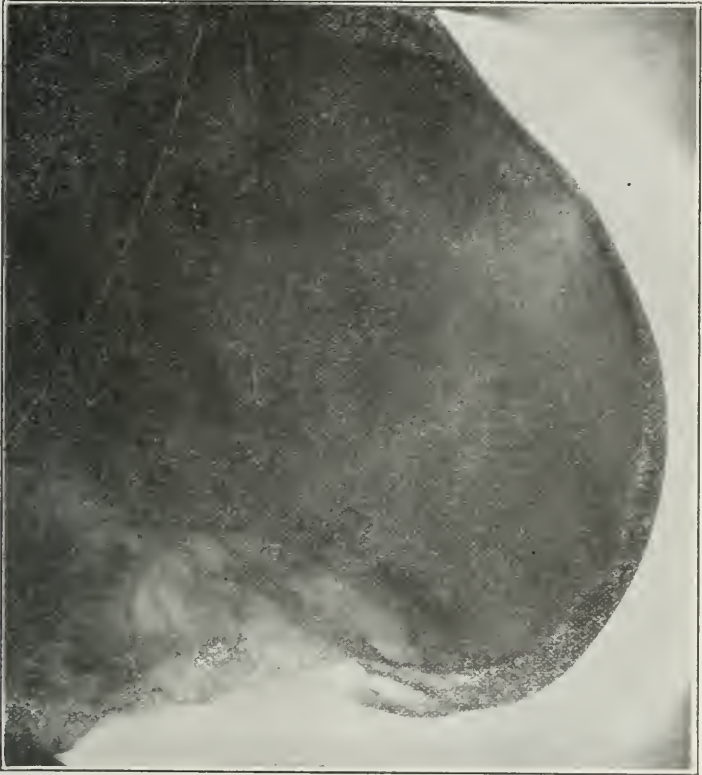


FIGURE 2.

Radiograph of Case 2, showing prominent forehead with flat orbits, with encroachment of bony process on optic nerve tract.

is rather uncertain. Apparently the deformity is congenital. The parents, however, reported at the time of her admission to the school that she could see, to a certain extent at least, till she was two and a half years old, at which time she had what they called spinal meningitis. Nothing could be learned

of the early condition of the fontanels or their time of closing.

Case 3.—Oliver D., aged twenty-one years, consulted us about a year ago for the correction of his right lower lid which had been everted for about two years. Physically a little above the average height, but slender, with poorly developed muscles. No signs of hypophyseal trouble. The head was of the typical oxycephalic type—high at the vertex, rather receding forehead. Depressed nasal bridge and protruding under jaw, and marked deformity of the teeth. The palatal arch was very high,



FIGURE 3.

Case No. 2 (b). Showing high prominent forehead with exophthalmos and thickening of lower lids.

almost amounting to a cleft. The intranasal structures were surprisingly free from deformity, and the accessory sinuses practically normal. There was a proptosis of 7 to 10 mm., with a divergence of 20 to 30 degrees in the left eye. No nystagmus. The vision was reduced to 8/200 and 5/200, respectively, which improved to 20/100 with minus correction. The cornea, lens and vitreous were normal, but there was a decided paling of both discs, with some disturbances of the retinal pigment. The form and color fields were moderately

reduced. The radiograph showed the posterior half of the wings of the sphenoid depressed to a level of the floor of the sphenoid, displacing the sphenoid sinus backward and the orbits forward, the posterior third of both orbits being prac-



FIGURE 4.

Radiograph of Case 3, showing peaked skull with digit markings, flap orbits, displacement of sella, with encroachment of bony processes on optic nerve tract.

tically obliterated, and changing the orbit from a cone to a saucer-shaped cavity. Early and family history were almost negative, his parents having died when he was a small child, and except that his eyes had always been weak, he did not

know much about his early life. Mentally he was somewhat stupid, possibly due to his poor vision, but was of a cheerful disposition. The unusual condition which I wish to emphasize was the complete eversion of the right lower lid. This was apparently not of paralytic origin, but due to the excessive exophthalmos. The conjunctiva was somewhat eroded and much thickened by the exposure. An attempt was made to



FIGURE 5.

Case No. 3 (a). Very high skull cap, flattened face, prominent lower jaw, marked exophthalmos, with complete eversion of right lower lid.

restore the lid to its normal position by means of a broad Thiersch flap and the removal of a V-shap piece from the outer angle of the lower lid. This held the lid up for a short time, but it finally became necessary to narrow the fissure by blepharorrhaphy at the outer canthus. As the lower left lid showed a tendency to evert, a blepharorrhaphy of the left outer

canthus was done also. A letter from the patient a few days ago says his lids are in good shape and causing no trouble.

Various theories have been advanced to account for the cranial deformity and the ocular symptoms which so frequently accompany it. Virchow's theory that the deformity is due to early or even prenatal closing of the fontanels seems to be pretty generally accepted, the skull expanding along the line



FIGURE 6.

Case No. 3 (b). Showing peaked vertex, marked divergent squint, and result of tarsorrhaphy.

of least resistance from the intracranial pressure. The X-ray reveals the results of this pressure on the floor as well as the roof of the cranial cavity; the flattened sella, depressed sphenoid wings and anterior displacement of the sphenoid cells are all traceable to continuous pressure during the developmental period.

Harman² reports a case in which the deformity was en-

tirely limited to the basal structures. There was exophthalmos, divergent squint, protruding lower lip, the usual facial symptoms, but without involvement of the skull cap.

As to the etiologic factors which produced the ocular symptoms, various writers differ. Paltracca and Merle,³ after a study of several cases, are of the opinion that premature union of the sutures is responsible for the condition.

Dorfman,⁴ from a study of three cases and the reports of others, is of the opinion that the premature closing of the sutures and resulting increased intracranial pressure causes an optic neuritis with secondary atrophy. He ascribes the synostosis to changes in the cranial vessels producing a low grade congestion, as advanced by Virchow. This circulatory disturbance is, in the experience of Anton,⁵ the causative factor.

Natanson⁶ has observed six cases and attributes the post-neuritic blindness to the intracranial pressure.

Fisher⁷ suggests the possibility of a meningitis antenatal or shortly after birth as accounting for both the deformity and the ocular symptoms.

Romme⁸ is of the same opinion as to the meningitis, and adds early closing of the fontanel, compression, exostosis and intracranial pressure.

Behr⁹ examined the tension of the cerebrospinal fluid and found it elevated to a certain extent, but does not attribute the optic nerve changes to be primarily due to this tension. He suggests an anomalous position of the internal carotid as a possible cause of direct pressure, in some of the cases the inner end of the floor of the optic canal being deficient, its place taken by the ascending arch of the internal carotid artery compressing the optic nerve against the orbital roof.

Eskuchen¹⁰ reports a case of *turnschadel* in a patient thirty-one years old, whose vision was sufficiently good for him to follow his trade of lithography. Following an attack of cerebrospinal meningitis the vision rapidly decreased to counting fingers at two meters with the best eye. This corresponds to the writer's case No. 2, in which the parents stated that the vision failed rapidly after an attack of what they called spinal meningitis.

Eskuchen advances the theory that the cases of nonprogressive atrophy may be due to a malposition of the internal carotid

artery, as mentioned by Behr, pressing on the optic nerve and causing an atrophy of the peripheral nerve bundles, but not advancing beyond this point. The papillitis and secondary atrophy are considered by Folinea¹¹ (Naples) to be the result of the intracranial pressure acting on the chiasm and sheath of the optic nerve. He thinks the premature ossification of the cranial sutures may be due to rachitis.

Bednarski,¹² with a report of seven cases, is of the opinion that the increased cerebrospinal fluid has more to do with the nerve changes than a possible meningitis. Three of his cases were rachitic, but he mentions this more as a coincidence, while Krauss¹³ thinks that chronic inflammatory diseases similar at least to rachitis may be the causative factor.

Uththoff¹⁴ made X-ray examinations in a number of cases and found distortion of the basal structures, especially the sphenoidal wings, with encroachments upon the cavity of the orbits. He mentioned intracranial pressure as a possible cause. Hirschburg and Grumnach¹⁵ made radiographic studies of a number of cases, in one of which the sella was very large, probably accounting for the optic nerve changes. An oxycephalic, twenty years of age, is reported by Krauss,¹³ in which there was an exophthalmos, muscle disturbance and postneuritic atrophy, with vision reduced to light perception. Radiographs showed the sphenoid depressed, encroaching on the orbital cavity. Krauss thinks the atrophy may be secondary to narrowing of the optic foramen.

In Carpenter's case¹⁶ the frontal, occipital and parietal bones were distorted and narrowed, orbits shallow, eyes were protuberant and easily dislocated, but with no changes in the fundus.

Beaumont¹⁷ calls attention to there being more cases of oxycephalus reported in males than females, and thinks this may be due to the relatively larger sized heads in male infants with consequent increased possibility of injury at time of birth, although he thinks this more apparent than real, and attributes the large proportion of males more to the fact that with them ossification takes place earlier in utero. He found five females in reports of fourteen cases, and quotes Patry, who found but seven females in sixty-four reported cases. He presents a case in which the deformity was noticed at birth. The eye were very prominent, the lids not

covering the cornea completely during sleep. He also quotes a case reported by Mr. Powers, in which both eyes were dislocated in front of the lids and could not be replaced. The child, a female, lived one month.

A case is reported at length by Terrien,¹⁸ of a girl aged seven years, in which there was a marked tower skull with mental dullness, early closure of the sutures, exophthalmos and optic atrophy. He is inclined to attribute the symptoms to a low grade congestion due to interference with the return circulation, and quotes Gudden, who has produced this early synostosis experimentally in young animals by slightly obstructing the return circulation.

In Itchapowski's¹⁹ case there was the usual skull deformity and exophthalmos, with the vision apparently normal until the child was two years old. The vision then began to fail and the nerves atrophied.

Klaatsch²⁰ reports a case with marked deformity, exophthalmos, papillitis and high intracranial pressure, which he attributes to congenital closure of the fontanels and sutures.

In Bednarski's¹² cases there was either neuritis or post-neuritic atrophy in all.

Postneuritic atrophy with marked constriction of the nerve was reported in Behr's²¹ case, but the optic canal was of normal dimensions. He attributes the trouble to interference with the lymph sheath.

Weekers²² reports a six-year-old child with marked cranial deformity, exophthalmos and optic atrophy. Radiograph showed unusual ossification in the sphenoidal and petrosal regions, with marked enlargement of the sella.

Until recently little has been attempted in the way of treatment. When the intracranial tension is high or where the ocular lesions are progressive, cranial trephining has been recommended.

Anton,⁵ after trephining, passed a probe into the ventricle, with relief of headache and vertigo and decided improvement of vision. In a case of congenital turmschadel with choked disc and progressive intracranial pressure, Kutner²³ did a palliative decompression, but owing to a congenital malformation of the tongue the patient contracted pneumonia and died before the result of the operation could be determined.

Dorfman,⁴ Behr²¹ and Natanson⁶ recommend trephining. As

a rule, however, the results of this operation have been rather disappointing, which has led Schloffer,²⁴ on the strength of Behr's experience, to remove the depressed roofs of the orbital canals in two cases. This has resulted in some benefit, but is of necessity a very radical procedure.

Larson reports nineteen cases, thirteen of which were from the Copenhagen Institute for the Blind, all males, and represented 21 per cent of the male inmates. Four cases were studied by the X-ray, and while the author found extensive changes in the basal structure, particularly the wings of the sphenoids, he was inclined to attribute the optic nerve changes more to a neuritis than to direct pressure in the optic canal. In all his cases there was decided decrease of vision, with varying degrees of optic atrophy. In fourteen there was exophthalmos, nystagmus in fifteen, convergent strabismus in two, and divergent strabismus in seventeen. The fact that thirteen of Larson's cases were inmates of the blind institute would account for the high percentage of grave visual deficiency shown in his series.

Skull deformities of this nature are evidently much more common in the European clinics than with us, for while nearly 14 per cent of the inmates of the Copenhagen Institute for the Blind were oxycephalic, a careful examination of the sixty-seven inmates of the Nebraska State School for the Blind, made for me by Dr. McVein, failed to reveal a single case.

In conclusion: First, although this condition has been recognized since the days of Mackenzie, the etiology is not clearly established, and cases coming under observation should be studied with this in mind.

Second, the extreme gravity of this condition in its relation to the eye should be early recognized and a guarded prognosis given.

Third, radiographic studies are helpful in determining the amount of deformity in the region of the sella, chiasm and orbital roofs.

Fourth, although the results of operative measures have been rather disappointing, yet in progressive cases decompression offers some hope of relief, and the patient should be so informed and given the benefit of this operation if desired.

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ABSTRACTS FROM ENGLISH OPHTHALMIC
LITERATURE.

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Recent Investigations Dealing With Inherited Syphilis of the Eye.

IGERSHEIMER, JOS. (*Ophthalmoscope*, December, 1913). says that with ocular syphilis, as with other syphilitic manifestations, it seems that in the majority of cases the disease comes to light only some weeks after birth. This is to be explained by the fact that children became infected only in the last months of intrauterine life, and that those fetuses which were infected earlier, either succumb to the infection before birth or soon afterwards. He examined ten newborn babies, whose mothers had shown certain signs of syphilis, in their first days of life, and could find neither disease of the eyes nor of the body.

He examined a series of cases, twenty-seven of whom displayed general symptoms of syphilis; their age was usually between two and eighteen months. Of those, six had normal eyes, while in twenty-one the state of the eyes was pathologic.

The first two observations concern cases of conjunctivitis, which certainly had something to do with syphilis, and which cleared up under antisyphilitic treatment alone.

Among thirty-one cases of keratomalacia in clinic, five had congenital syphilis, which, however, was probably only a contributing factor.

A doubtful case of keratitis parenchymatosa, a case of iritis, and a pseudoglioma were observed.

By far the most frequent syphilitic affection of the eye in babyhood is choroiditis or choroidoretinitis, which takes the form of more or less numerous spots, usually situated in the periphery of the fundus. "It appears to me quite possible, indeed probable, that this peripheral choroidoretinitis, when it is found in eyes in which in later childhood a keratitis parenchymatosa develops, has generally commenced in babyhood or childhood, and so belongs to the 'condyломatous' phenomena of congenital syphilis, which, according to Hochsinger, terminate with the fifth and sixth year." Although most frequently observed in cases suffering from interstitial keratitis, this choroidoretinitis has probably preceded the former condition for years. In fact, "I can positively state that I have never, at least up to now, seen a keratitis parenchymatosa where previously the fundus was normal and afterwards was found to be abnormal. I have also never heard of such in the literature."

Affections of the optic nerve may be observed occasionally in babies. More frequently, however, one observes a pallor of the nerve which is not the result of an atrophic process, but of a high grade anemia. Heine said that he ascertained in one hundred and five babies at the breast, 81 per cent had optic neuritis, but the author's series fails to show a similar result: "Although I cannot dispute the occasional occurrence of an optic neuritis, I must, nevertheless, in view of my personal experience, reject the possibility of its frequent occurrence. As regards atrophy of the optic nerve, I must refer you to the possibility just mentioned of confusion with anemic conditions of the optic disc. Should the interpretation of the

authors quoted (Japha, Heine) be correct, then we should see decidedly more atrophy of the optic nerve in childhood than is actually the case. It is certainly not to be denied that where an atrophy of the optic nerve has been established, syphilis may have played an important part as an etiologic factor. I found among twenty-seven cases of atrophy of the optic nerve that about 25 per cent of the patients showed signs of syphilis. In one case alone did the affection apparently date from birth or babyhood."

Nystagmus without ophthalmoscopic abnormalities was frequently encountered. Of twelve such cases found, hereditary syphilis could be established in eight with the aid of the Wassermann reaction. Pendular nystagmus and nystagmoid movements, horizontal and rotatory nystagmus, have so far been seen. Bad derangements of sight were never present.

Diseases of the lacrimal drainage apparatus in children deserve special attention. In the author's cases there were found sixteen with signs of syphilis, as against seven without syphilitic symptoms. In two cases of dacryostenosis in congenital syphilis nothing was found in the nose. In eight cases unilateral or bilateral blennorrhea was present; three times a fistula of the lacrimal sac; once dacryocystitis, and twice phlegmon of the lacrimal sac. For this he admits two causes: (1) An affection of the nose; (2) an affection of the bony wall of the lacrimal duct. No specific alterations could be found in the tissues of the extirpated sac, but only lymphocytic infiltration. No spirochetes were found in the tissue.

The author has devoted considerable time to the investigation of keratitis parenchymatosa about two questions: (1) The origin of the disease, and (2) the after-fate of patients who have suffered from it.

Judging from animal experimentation of producing interstitial keratitis by the injection of spirochetes into the blood stream, he concludes that the keratitis parenchymatosa of the fetus and nursing is also a purely spirochetal infection. "The spirochetes, however, which sometimes get into the cornea of the congenital syphilitic during fetal life, cause an inflammation of the corneal tissues only in rare cases, but they subsist for a longer or shorter space of time in the cornea. It may be taken for granted that many of them die off slowly. However, with this death of the spirochete and the liberation of

endotoxic products, a specific tissue change (Umstimmung) makes its appearance; or, to express it differently, there is an anaphylaxis of the cornea. The older the individual the more probable it is the anaphylaxis will be prominent, and that the living spirochetes will become fewer or disappear."

"Leaving out of account interstitial inflammation of the cornea in the fetus or the newborn, it seems to me necessary to hypothesize two things for the causation of keratitis parenchymatosa:

1. The spirochetes themselves.
2. The specific tissue change (Umstimmung) of the corneal tissue."

Spirochetes may be in the blood for years and yet not give rise to an interstitial keratitis, hence the presence of organisms alone does not account for this disease: "but it seems more plausible that somewhere in the stage of hereditary syphilis, specific toxic products from some of the syphilitic foci which are to be found in the body have got into the circulation. If these come into the specifically unchanged cornea, they may cause in it an anaphylactic reaction in the form of a keratitis parenchymatosa, a reaction which is very similar to the anaphylactic keratitis produced in animals by introducing a foreign species of serum. Possibly the specific toxic substances which get into the cornea exert an influence also on the spirochetes which may happen to be living, so as to excite an inflammation."

That there are spirochetes in the cornea of hereditary cases has been proven, so that both conditions hypothesized above are found. In acquired syphilis, however, the number of spirochetes circulating in the blood is comparatively few, and they exist for a comparatively short time, so that the microorganisms very rarely penetrate the cornea. One of the hypothetical conditions of the origin of a keratitis parenchymatosa is, therefore, wanting; hence its rareness in acquired syphilis. In those cases of acquired syphilis who do have the corneal affection, it would be interesting to know how many of them also had the hereditary form and had become reinfected.

"The keratitis parenchymatosa which originates in conjunction with syphilitic processes of the conjunctiva and the eyelids should be regarded as a pure spirochetel infection arising per continuitatem."

A comparative table shows that the after-fate of the patient who has suffered from keratitis parenchymatosa is worse than one would generally suppose, 40.8 per cent of his cases having a vision of less than 5/25.

A second table, based on an inquiry and on an objective determination of facts, "demonstrates how keratitis parenchymatosa encroaches upon the power of earning one's living. Of seventy-seven patients, forty-three are to be regarded as permanently injured in their livelihood or power of gaining a living; among the twenty-eight who were not injured, many were to be found who had already gone through keratitis parenchymatosa as school children, and so could select a profession to suit their eyes."

Another table illustrates that after the expiration of an affection of the cornea the Wassermann reaction becomes quite gradually negative. The effect of syphilis is also to be found in the second and third generation. W. R. P.

Infarction of the Posterior Ciliary Arteries.

COATS, GEORGE (*Ophthalmoscope*, December, 1913), reviews a previous case published in the *Trans. Ophthal. Society*, Vol. XXVII, 1907, p. 135, briefly summarized as follows: Man, aged thirty-eight years, complained of dimness of vision in left eye for twelve months. Said to have no congestion, pain or exophthalmos. Lens became opaque about six months after onset of symptoms. When seen, chronic iridocyclitis present. Old corneal precipitates; iris discolored and covered with large new-formed vessels. Lens cataractous. Scleral staphyloma forming. Right eye normal.

Pathologically—Patch of choroidoretinal atrophy above disc. Commences 4 to 5 mm. from nerve entrance, with which, however, it is connected by an atrophic streak, and measures 10 mm. in diameter. Microscopically it shows a necrotic patch in the sclera, a roughly corresponding necrotic patch in the choroid, and complete necrosis of the retina in a somewhat more extensive area.

Case 2.—Attack of iridocyclitis with increased tension, in a man aged forty years. Quiescent for two years, after which eye was lost from an infected ulcer of the cornea. Other eye normal throughout.

Pathologically a large roughly quadrangular white area on the nasal side of the nerve entrance, consisting microscopically of a wedge of necrosis in the inner layers of the sclera with surrounding inflammatory lesions, and profound degenerative changes with little inflammation in the choroid and retina. The affected area in the choroid and retina larger than in the sclera. Some atrophy of the outer layers of the retina beyond the patch. Elsewhere retinal changes slight, and choroidal practically absent. Some cupping and atrophy of the nerve. Lesions in the anterior part of the eye, partly those of a recent infected ulcer, partly those of an old plastic iridocyclitis.

He remarks that "it is evident that these two cases closely resemble one another and differ in important particulars from ordinary instances of choroidoretinal inflammation or degeneration. In both the clinical appearances were those of a seemingly idiopathic iridocyclitis with raised tension: in both, on dividing the eye, a large, more or less quadrangular patch of choroidal atrophy was found, commencing a little distance from the nerve entrance, but joined to it by a streak of atrophy, measuring from 8 to 10 mm. in diameter; in both a wedge of the innermost layers of the sclera had undergone necrosis, while a larger area of the choroid, and a still larger area of the retina, showed in the first case necrosis, in the second extremely profound degenerative changes, probably indicating the former presence of necrosis; in both this area of necrosis and degeneration was surrounded by inflammatory reaction of moderate degree, associated in the first case with very little, and in the second with some thickening of the sclera: in both the transition to normal retina and choroid was more rapid in the periphery of the patch than on the aspect toward the nerve entrance; in both there was evidence of a deposit of inflammatory cells on the inner aspect of the retina; and in both the signs in the anterior part of the eye were those of a nonspecific plastic iridocyclitis. The chief point of distinction from a patch of choroidoretinitis lies in the preponderance of necrosis over inflammation. Except at the edges the necrotic tissues are not at all infiltrated. Moreover, the adhesion and fusion of the choroid and retina, which are so characteristic of choroidoretinitis, are absent over the greater part of the area."

In the retina and sclera the characters were those of the

pale infarct, while in the more vascular choroid the hemorrhagic infarct was somewhat imitated. The cellular infiltration at the margins of the necrotic area are explained as reaction to toxins liberated by the necrosed cells. So also the necrosis of the retina, which has its own blood supply, is possibly produced by the effect of toxins. Although several sections of the eye were made, the obstructed vessel could not be found, but that there was an obstruction of a ciliary vessel is concluded from the nature of the pathologic evidence.

W. R. P.

The Visual Fields in Coal Miners' Nystagmus.

CRIDLAND, BERNARD (*Ophthalmoscope*, December, 1913), obtained visual fields in twenty-five cases out of some sixty or seventy cases examined. Nearly all were cases of the "grave" type, men who had been forced to give up their work, but in whom the nystagmus was not so pronounced as to interfere with the integrity of the field chart.

An examination of the charts revealed the following points:

1. In practically all the cases contraction exists for white, blue and red.

2. The contraction is of the concentric type and symmetrical in shape, although not always in depth.

3. In the majority of cases the colors are in their correct order, but occasionally interlacing of the red and blue may occur, recovering their correct order as the case improves.

4. The contractions for red and blue are generally greater than those for white, and greater for red than blue.

5. By grouping the cases into mild, moderate and severe types, according to the intensity of the attack, the fields broadly show corresponding contractions. In one very severe case the field for white was contracted to the 20° limit temporally, and to 10° elsewhere in each eye; that for blue to 4° whilst red was only recognized at the fixation points. In two cases, which must be classified as of the "light" form, for nystagmus movements existed without, I believe, the patients being aware of them, very slight contractions were present for white, and definite contractions for blue and red, the latter being more marked.

6. Generally speaking, as the disease improves the fields of vision improve, but contractions persist as long as any subject-

ive symptoms are present, although nystagmic movements cannot be elicited by any test.

7. Slight contractions for white may, perhaps, be permanent, and to a greater degree for red and blue, especially for red. One case showed that this may be so. A man of fifty-two had suffered from an attack for nearly three years, but at the time of examination had neither signs nor symptoms, yet the fields, taken just after recovery, showed contraction as above stated.

8. Most of the cases showed more or less signs of "neurosis," such as blepharospasm, neck-twitching, etc., but there seems to be no direct relationship between the pressure and degree of these signs, and the degree of contraction of the visual fields, except that both may be well marked in a severe case.

He further comments that while these fields are similar to those found in cases of traumatic neurasthenia, it is impossible to look upon many of these cases as suffering from that disease.

W. R. P.

Hyalin Bodies at the Optic Disc in a Case of Retinitis Pigmentosa.

OLIVER, GEORGE H. (*Ophthalmoscope*, December, 1913), reports a case of retinitis pigmentosa in a male twenty-five years of age, in which semitranslucent excrescences were found at the disc borders in each eye. The diagnosis of retinitis pigmentosa had been made when he was thirteen years old. The patient was the fifth child of a family of six, four sons and two daughters. He was well nourished, but distinctly below the average in mental capacity and somewhat deaf. There was no trace of syphilis about him or any member of his family.

The ophthalmoscopic examination showed the media to be clear, with degenerative processes in the retina extremely well marked, as evidenced by the amount and distribution of the retinal pigment. In the right eye were two translucent masses, one on either side of the disc, the edges of which they overlapped, each approximately one-fourth of the circumference of the disc in length, and separated above and below by an equal length of disc margin. When the bodies came into relation with the blood vessels, the latter coursed beneath the

former. In the left eye there were six masses of similar appearance, but of a different shape. They appeared to project into the vitreous from 6 D. to 10 D., the larger ones being more prominent. He compares the surfaces with that of a minute, closely knit cauliflower. A plate of colored drawings accompanies the article.

W. R. P.

Sclerotomy Versus Sclerectomy.

HERBERT, H (*Ophthalmoscope*, January, 1914), advocates a filtering cicatrix that will permit of wide diffusion of aqueous under the conjunctiva, as against an incision that will tend to localize the filtration. The latter condition tends to make vesicular cavities covered only by a thin transparent film of conjunctiva which does not afford adequate protection against the invasion of organisms. "Any approach to this disfiguring and dangerous result of localized leakage," he says, "is to be avoided at considerable cost, whenever possible." Excellent examples of the filtering cicatrix are found after some flap sclerotomies, after some iridectomies, and after some cataract extractions. The thin gray line of filtration is made of fairly loose fibrocellular tissue and downgrowths of subconjunctival tissue. This tissue affords ample protection against the possibility of late infection, and the conjunctival covering remains almost normal. The amount of filtration through such an opening is limited, so that reduction of tension cannot be much overdone. "An unfortunate limitation of the filtrating scar is that apparently it is unattainable in eyes with much ciliary congestion, and in many secondary glaucomas. Here incisions tend to heal up absolutely firmly, except where definite fistulous openings are formed."

As regards the permanency of the filtrating scar, he thinks later failure of filtration may be due to leakage becoming reduced, or advance in the essential glaucomatous changes in the eye while the filtration remains fixed.

Among the dangers of operation he regards late infections first: "At present every attack of iritis or iridocyclitis in an eye with a leaking scar must be looked upon with suspicion, unless the eye has suffered from similar attacks before operation. We have yet to learn (1) whether the risk of late sepsis is confined solely to cases in which the conjunctival covering has become cystoid or vesicular, and (2) whether the danger

is influenced in degree and kind by intentional (?) inclusion of iris in the subconjunctival opening." "The growing number of late septic disasters following sclerectomy in Europe is causing much concern. In so far as the liability is limited to the one eye, an infection loss is not much worse than blindness from unrelieved glaucoma. It has yet to be seen whether a fistulous tract is less likely to involve the fellow eye in sympathetic disease when iris-free than when containing iris. If it is not less likely to do so, then the position of trephining is much the same as that of the old iridocentesis operation, and it is only a question of time for it to share the same fate."

Rapid complete loss of sight, unconnected with hemorrhage, may follow sudden loss of tension, or circulatory disturbances, as general vascular stasis and thrombosis, may, through impairment of nourishment, lead to visual disturbances. Simple subconjunctival incision is preferable in hydrophthalmia; even failure to relieve tension must be risked as the lesser of two evils.

Permanent partial loss of vision must also be regarded as a result of sudden reduction of tension also due to a minor grade of the circulatory difficulties which lead to the total loss of vision above mentioned. "The appeal for conservatism is strong. I believe that the deliberate fistulization of eyes is wrong in principle, except in the types and stages of glaucoma in which true filtration is found to be unattainable or ineffective. In some hard, painful, chronically congested eyes, with vision generally poor, and in many secondary glaucomas, the establishment of a wideopen subconjunctival stoma is apparently the only possible means of keeping the tension low. Here one has to make the best of a bad position. The choice lies between the risk of late infection, such as it is, and certain blindness (if it is not already present), possibly with the removal of the eyeball for the relief of pain."

He believes that fistulization will soon be regarded as unjustifiable in the following conditions: (1) Very advanced hydrophthalmic eyes, least able to bear hypotony; (2) quite early chronic glaucoma (operation being necessitated or warranted because of imperfect control by myotics, or because of conditions unfavorable for regular observation), and (3) chronic simple glaucoma with only slight elevation of tension, though possibly with much contraction of field of vision.

The ideal operation must provide a linear filtering cicatrix, or the nearest possible approach to it, with a minimum of risk. Iridectomy should be avoided where the chamber is not exceptionally shallow and when the pupil can be kept contracted with eserine. To prevent complications of the iris he advises three precautions: (1) The placing of the incision as far forward as possible, more particularly as regards the deep surface of the cornea; (2) using such measures as are available to promote early refilling of the anterior chamber, and (3) a restricted use of cocaine and adrenalin, which together tend to dilate the pupil, in spite of eserine instillation.

"Since the natural tendency of sclerotomy appears to be toward true filtration, while the tendency and avowed aim of sclerectomy is towards fistulization, it seems likely that the former will be found to give better results in the great bulk of eyes affected with primary glaucoma but still retaining useful vision."

W. R. P.

A Case of Panophthalmitis Caused by *Bacillus Subtilis* Following a Cataract Extraction.

BUTLER, T. HARRISON (*Ophthalmoscope*, January, 1914), reviews the literature on organisms which have been found in cases of panophthalmitis, and reports a case in which an Arab woman had her cataract extracted by Dr. W. E. Cant at the British Ophthalmic Hospital, Jerusalem. The operation was followed by panophthalmitis. Some years after, Dr. Butler tried to extract the second lens after preliminary iridectomy. It became dislocated into the vitreous and he failed to extract with the vectis. Three days later, although he had adopted every aseptic precaution known to him, panophthalmitis set in.

A second case was a male laborer, aged sixty-five years, who had contracted syphilis when a young man. There was an anterior choroiditis almost certainly syphilitic in nature, white patches of atrophy, and small floating opacities in the vitreous. On admission to the hospital a culture was made and a copious growth of *staphylococcus albus* grew. The eyes were treated until the sac became sterile and a preliminary iridectomy was done. This was followed by no reaction. About fourteen weeks later the lens was extracted without complications. The only instruments introduced into

the eye were the knife, cystotome and repositor, all of which had been boiled.

Two days later the eye was inflamed and rather painful, much chemosis, some lymph on wound, but no pus. Nothing grew on a culture taken at this time.

Two weeks later the eye was excised for panophthalmitis. When bisected it was seen there was a collection of pus in the vitreous and a tract of pus led from the wound to the vitreous.

Tubes of blood serum and agar were inoculated from this pus, and three organisms were separated: (1) A copious growth of staphylococcus albus, (2) a few gram-positive rods with morphologic characteristics of bacillus subtilis, (3) a small gram-negative bacillus.

After describing in detail his method of sterilization of instruments and preparation of the eye, he concludes, "that the panophthalmitis was caused by an infection with the spores of subtilis, probably introduced by the knife. It was likely that the secondary infection with staphylococci and bacteria coli (the gram-negative rods) had some connection with the subconjunctival flora, although we failed to grow them from the cul-de-sac."

W. R. P.

On the Technic of Evisceration.

GEFFORD, H. (*Ophthalmoscope*, January, 1914), calls attention to a former paper in which he advocates a Mules operation without excision of the cornea, and reviews the technic. But, "as my unfortunate experience has compelled me to renounce Mules' operation in all its forms, except where the patient specifically accepts a slight increase in risk for a slight cosmetic advantage, the operation which I commonly perform as a prophylactic against ophthalmia is the following: The cornea is cut across, but is not removed, by an incision which extends one-fourth inch into the sclera at each side. The contents of the globe are scraped out, the utmost care and vigor being used in the ciliary region and at the entrance of the nerve. The interior of the cavity is then carefully and vigorously rubbed out with several somewhat globular gauze swabs. The cavity is then irrigated with a good strong stream of sterile boric solution. The anterior half of the sclerocorneal wall is then pushed back against the posterior

half with a good sized globular swab dipped in sterile oxid of zinc ointment. Lastly a compressive bandage is applied. The swab is removed after forty-eight hours."

The points he emphasizes are: (1) That it is better not to do a keratectomy, even if a Mules operation is done; (2) that when in doing a Mules the cornea is sacrificed, whether from choice or necessity, the line of sutures should be protected by sliding the conjunctiva down and attaching it firmly to sclera three-sixteenths of an inch below the sutures; (3) that when a Mules is not done, the best evisceration stump is obtained by flattening the sclera, as indicated above.

W. R. P.

Dichromic Vision.

EDRIDGE-GREEN, F. W. (*Ophthalmoscope*, January, 1914). Dichromic is the term applied to those who have only two color sensations and white. They see only two colors in the spectrum; they note a neutral area, confuse red, yellow and green with each other, and purple with green and gray, differing, therefore, from the trichromics, who have three color sensations, no neutral area, do not confuse red and green except when especially difficult, and who see purple as a definite color.

The author considers it wrong to assume because the mixing of two colors gives rise to the appearance of a third color, the sensation of that third color is due to a similar mechanism. Color blindness found in dichromic vision is a defect of hue perception. It is quite possible to suppose that a person might have only two color sensations, and yet be able to tell the least difference between the mixtures of these sensations, have a hue perception which, though not similar to the normal, is quite sufficient for all practical purposes, and their color blindness quite difficult to detect. The color vision of dichromics differs from those nearly trichromic to those almost totally color blind, hence the variability of their detection by ordinary tests.

Tables are given showing the limits and position of the most luminous and neutral regions in the dichromic, and extent of monochromatic areas in the dichromic. W. R. P.

Dichromic Vision. (Continued.)

EDRIDGE-GREEN, F. W. (*Ophthalmoscope*, February, 1914). Varieties of dichromic vision.—The author states that in addition to the varying hue perception which is found with different dichromics, there may be associated defects of light perception. Shortening of the red or the violet end of the spectrum, defective perception for some of the other spectral rays, abnormal position of the maximum of the luminosity curve, defective perception from a diminished image on the retina, produce characteristic symptoms and are not in themselves the cause of the dichromatism in the subject examined. Of all the large number of cases which he has examined, he has not found one which, when examined in the manner he has described, would support the Young-Helmholtz or Hering theories. He has found so-called cases of green blindness with no defect in light perception in any part of the spectrum.

As to the nature of the two color sensations of the dichromic, he says, "there has been much discussion as to the nature of the two color sensations of the dichromic, whether they correspond to any of the normal color sensations or whether they are quite distinct. In dichromic cases in which only two colors are seen in the spectrum, it is obvious that any portion included in the monochromatic area might be taken to represent that area. If in the evolution of the color sense the first two colors to be discriminated were red and violet, these two colors should be most representative of the two color sensations. I am now convinced that this is the case, and that the two colors seen are a red and a violet, with less color difference between them and less saturation than the red and violet seen by the normal sighted."

SUMMARY.

1. There are many degrees and varieties of dichromic vision.
2. There are not two well-defined varieties of dichromic vision, there are innumerable gradations connecting the two.
3. In many cases precisely the same errors are made both by those with and without defective perception of red, when the rays for which there is defective perception are not involved.

4. All dichromics are not equally color blind; that is, one may have a much better hue perception than another.

5. Dichromic vision may be associated with defects of light perception which are also found in cases in which the vision is not dichromic.

6. Dichromics may have a perception of shade and a luminosity curve similar to the normal.

7. Many dichromics match very accurately, their color perception being sufficient for this purpose when the colors are not too close in the spectrum.

8. The degree of color blindness varies with the state of health.

9. Color discrimination is diminished as a whole in dichromic vision.

10. Dichromic vision appears to be due to a defective power of color differentiation, probably corresponding to an earlier state in evolution of the color sense.

11. The two colors seen are red and violet.

W. R. P.

Six Cases of Tumors of the Lacrimal Gland, With an Account of the Pathologic Findings.

ELLIOT, LIEUT.-COL. R. H., AND INGRAM, CAPT. A. C. (*Ophthalmoscope*, February, 1914), observed six cases of tumor of the lacrimal gland within a period of eleven months. In two cases the pathologic diagnosis was that of endothelioma; two were sarcomata, one with spindle and one with round cells; one was not examined; one, stated by competent pathologists to have presented all the appearances of a syphilitic gumma, was later found to be a malignant tumor.

Col. Elliot calls attention to a few outstanding features of these cases:

1. The growths stretched very far back; much further, indeed, than an examination would lead one to expect.

2. In four out of five cases the growth was very hard.

3. In every early case the accessory portion of the lacrimal gland was invaded by the growth and presented a characteristic appearance. On eversion of the lid it looked almost as though an almond had been let in under the conjunctiva.

4. Even allowing for the unreliability of Indian histories, one cannot fail to be struck with the very rapid course run

by these tumors. An early recurrence would also appear to be probable, even in the case of a most thorough removal.

5. A granular feel would also appear to be a common feature in malignant tumors of this gland.

6. The patients' homes were scattered all over the south of India, and one can find no factor to explain the extraordinary coincidence of so many cases in so short a period.

W. R. P.

A Case of Bilateral Annular Trachomatous Pannus.

WADDY, R. GRANVILLE (*Ophthalmoscope*, February, 1914), reports a case from the Traveling Ophthalmic Hospital of Egypt, which bore a remarkably close resemblance to vernal catarrh, but which proved to be trachoma. The patient was a six-year-old male, with a negative history except that both parents were trachomatous, the mother in stage two and the father in stage three.

On each side of the cornea, about midway between the limbus and canthus, was a crescentic aggregation of infiltration, the concave margin being towards the limbus. The areas were edematous, pinkish, gelatinous and raised $1\frac{1}{2}$ mm. above the general conjunctival surface. Each mass was 4 to 5 mm. in vertical length and 1 mm. in horizontal breadth. The tarsal conjunctiva was in the follicular stage of trachoma. Extending completely around the limbus was a raised edematous pannoid growth, extending uniformly on to the cornea for a distance of 3 mm., but leaving a central zone of clear cornea. There was no evidence of iritis. Pathologic examination showed a few Koch-Weeks bacilli, large mononuclear cells, small mononuclear, few polynuclear, mast cells here and there, and only two or three eosinophiles to the slide. The so-called trachoma bodies were abundant.

W. R. P.

An Inquiry Regarding Increased Tension of the Eyeball.

RISLEY, S. D. (*Ophthalmoscope*, February, 1914), classifies into eight well-defined groups cases of glaucoma characterized by increased tension of the eyeball and its disastrous sequelae, and by certain pathologic findings in the laboratory, more or less common to them all.

Atypical form of glaucoma:

- (a) The buphthalmic eye of infancy and young childhood.
- (b) The cases of serous iritis.
- (c) Chronic, recurrent iritis of the plastic type.

In another group:

(a) Of perforated cornea from corneal ulcer, or, by perforating and infected wounds, leading to partial corneal staphyloma, empty anterior chamber, iridocyclitis, increased tension and loss of vision.

Primary glaucoma:

(a) Glaucoma simplex, or the so-called noninflammatory type.

(b) The subacute inflammatory type.

(c) The acute inflammatory type.

(d) The so-called hemorrhagic glaucoma.

The cases of buphthalmos, secondary glaucoma accompanying serous and plastic iritis, he believes to be due to uveal disease, the ocular manifestations of a more general or systemic disease. The ophthalmoscopic study of early cases of iritis show a "fluffy eye ground, dark homogeneous red in color, full vessels with all details veiled or obscured by infiltration or edema." The early increase in tension is due to a colloidal secretion of the diseased uvea.

The inflammatory types of glaucoma are ocular conditions analogous to other symptoms of general disease. "In chronic rheumatic or gouty subjects the swollen and painful joints, following exposure and indiscretion in diet, giving rise to toxic or other states of the blood, afford an analogous condition of pressure and pain. Uremic coma affords a striking example of intracranial edema and pressure."

Three cases of noninflammatory glaucoma are reviewed at length, having been observed over a period of many years. These cases were known to be subject to periods of high blood pressure and attacks of arthritis deformans. He suggests, then, a systemic dyscrasia as an etiologic factor in their glaucoma.

W. R. P.

Report of a Case of Monocular Paralysis of the Accommodation Due to Lues.

DOWNNEY, JESSE WRIGHT, JR. (*Journal A. M. A.*, September 27, 1913). The patient, whose age is not stated, gave a specific history of five years' duration. The vision of the left

eye failed suddenly for reading. On examination he was found with the pupil partially dilated, vision 20/20 with correction, but requiring a + 4 to bring the near point to 18 cm. The lesion was probably nuclear between the sphincter nucleus and the point where the fibers from the ciliary nucleus join the pupillary light reflex bundle. An intravenous injection of salvarsan was given and complete recovery was the result.

E. S. T.

Burn of Eyes From Contents of Golf-Ball Core.

LOWELL, HOLBROOK (*Journal A. M. A.*, December 27, 1913), quotes four cases, all children, in which opening a core of a golf-ball was followed by spurting of the fluid into the eye, and severe acid burn, resulting in the loss of one eye in three of the cases. Analysis showed the contents to consist of barium sulphate, soap and a free alkali.

E. S. T.

Hysteric Blindness of Both Eyes in Elderly Men.

NEWMARK, L. (*Journal A. M. A.*, January 10, 1914), calls attention to the assertion that hysteria is chiefly observed in young persons and in females. Two cases are reported. The first, an Irishman, aged sixty years, master of a coasting steamer, had noticed for two or three months that his vision was failing. He worried a great deal over this and became almost sleepless and had severe headaches, but finally awakened one morning "totally blind." He admitted that he was not in total darkness, but stated that there was a dense fog around him. Flashes of light from focusing mirror were easily perceived. Other evidence of hysteria were present, but later he made a complete recovery, and was examined and found to have practically normal vision. The author calls attention to the fact that the headaches were probably a source of the trouble, in that the patient feared organic brain disease. Writers on the subject have pointed out that blindness has occurred especially in those cases of hysteria in which headaches and encephalic symptoms predominated.

The second case was a clergyman of fifty-four years, who became suddenly blind while in the pulpit. Hemiplegia followed. Three days later there was slight improvement with marked photophobia. Two weeks later his vision was re-

ported as almost normal. Exact tests could not be obtained. The color fields were finally taken by a colleague and were irregularly contracted for red and green, but not reversed.

E. S. T.

Hereditary Optic Neuritis.

WARTON, A. S. (*Lancet*, October 18, 1913). This affection, frequently known as Leber's disease and also by the synonym hereditary optic atrophy, was first clearly described by Theodore Leber in 1871. It is characterized by rapid loss of central vision, usually lasting some considerable time, and followed in a certain proportion of cases by more or less spontaneous recovery of visual function. Both eyes are affected as a rule, either simultaneously or within a few days of each other. The loss of central vision is evidenced by a central scotoma, usually absolute in character, the peripheral limits of the visual fields remaining normal in extent. Many of the cases regain full normal visual acuity after the attack, but even in these cases some deficiency of the light sense can usually be demonstrated by a comparison of the results obtained from the black and gray (Bjerrum) test types. A few cases, on the other hand, go from bad to worse, and vision may be permanently reduced to hand movements or the merest perception of light. Between these extremes a varying amount of useful vision may be regained by the sufferers, and this amount is probably influenced to some extent by the mode of life, both before and during the course of the attack.

The condition is essentially one of inheritance and follows the type of a sex-limited disease, in so far as males are very much more liable, transmission occurring usually through unaffected females.

Consanguinity takes no part in the production of the condition, and the only risk from a consanguineous marriage is where an affected male marries a cousin who herself carries the disease latent, deriving it either from her affected father or through her mother from an affected male of an earlier generation. The usual age incidence of the disease is from fifteen to twenty-five years, although cases have been recorded as early as five and as late as seventy-five years of age.

The pathology is obscure, no record of findings during the course of the attack having been made or as yet published. By some the lesion is regarded as an axial or descending nen-

ritis set up by some toxic agency or periostitis in the neighborhood of the optic foramen. Others, following the recent researches of Birch-Hirschfeld on the toxic amblyopias, regard it as primarily a retinal affection, and the resulting neuritis of the ascending type. Regarded from this point of view, the all-important predisposing cause of heredity would seem to imply an inherent instability of the neural elements of the retina, specially affecting the maculæ as the zones of chief activity and most highly specialized cells. It must be admitted, however, that no definite toxic agent has yet been discovered which would act as a specific exciting cause, but it would seem unnecessary to assume the existence of such, and probably any factor tending temporarily to depress the general vitality would serve in predisposed individuals to precipitate the attack. The connection between this disease and early familial death has been pointed out, notably by Gould and Ogilvie, and with epilepsy by Hancock.

The diagnosis would depend chiefly on the discovery of similar cases in other members of the family or on tracing backwards through the female side of the genealogic tree. From retrobulbar neuritis it is distinguished by the absence of pain on pressure over the eyeball or on movements of the eyeball. Retrobulbar neuritis is frequently unilateral and runs its course towards recovery in a very much shorter time. The scotoma associated with it is also frequently relative throughout. Tobacco amblyopia is infrequent before the fourth decade of life, the scotoma is usually relative in character, and recovery, as a rule, rapidly occurs when the tobacco is stopped.

The ophthalmoscopic appearances during the attack are those simply of a mild neuritis, hyperemia of the discs, fluffiness of the disc margins, and slight perivasculitis. The neuritis slowly subsides, and the signs of atrophy supervene, the discs becoming paler, chiefly on the temporal sides. Some filling-in of the physiologic cups and faint lines traceable some little distance from the disc along the vessels mark the increase of connective tissue following the inflammatory process. Some disturbance of pigment between the disc and macula has been observed in a few cases, and occasionally curious shimmering reflexes from the fundi, mainly along the course of the vessels, have been noted a long time after the

attack. In one case (No. 10) observed by the author, minute macular changes were also observed at the beginning of the disease.

The prognosis as to complete recovery of vision in a given case must be extremely guarded, but as regards retention of a useful amount of vision would appear to be good, and even in the worst cases perception of light has been retained. It is necessary to bear in mind, however, that improvement of vision rarely begins before six months from the start of the disease and has been delayed as long as three years.

With regard to treatment, it is doubtful whether the course of the disease is modified to any appreciable extent by drugs or other form of treatment. The neuritis, of course, will demand the use of dark glasses and the inhibition of all eye work. Measures directed to the maintenance of the general health, together with the avoidance of all injurious indulgences—e. g., sexual excess, alcohol, tobacco—will be required, and possibly the degree of ultimate visual recovery will be favorably influenced by small daily doses of the liquor strychninæ hydrochlor.

Eleven cases are reported in one family in three generations.

N. M. B.

The Causes and Symptomatology of Impaired Retinal Activity.

BERRY, GEO. A. (*Lancet*, October 25, 1913), in his conclusion states: What I have aimed at in this lecture is to draw inferences to explain defective vision from disease by comparison with certain known facts in the physiology of vision. Further, having done so, I have attempted to justify the selection which I advocate of the different methods for the subjective examination of central and excentric vision. I have also pointed out some of the conclusions to which the results which may be got by such examinations lead.

We have seen that, physiologically, when the intensity of a light stimulus, acting only on a few end organs of the retina, is diminished in any way—that is, when either the brightness of the test object or the contrast between it and its background is diminished—then the visual acuteness, the power of recognizing detail, is lowered. And for diminished intensity of stimulus in the case of the normal eye we have assumed diminished excitability, conductivity, or receptivity

in that of the diseased eye. A priori the result must be the same in both cases.

That the assumption is justifiable is shown by the fact that in every case of acquired visual defect, with obvious exceptions, the light sense for small visual angles is diminished. As this is not necessarily the case for larger visual angles, it follows that a summation of feebler individual impressions must have the effect of causing a stronger total impression. We have found that both the light and color senses are greatly dependent upon the size of the angle under which any object is seen. The eye is unable to detect anything like as small differences in the intensities of contiguous retinal stimuli under a small, as it does under a greater, visual angle. And this circumstance, when taken along with the physiologic imperfection of the retinal images of external points, is the reason why visual acuteness is greater in what we call a good light than it is in a sufficiently bad light. Thus is explained the drop in acuteness which takes place, physiologically, in the dark—a drop which is, however, greatly modified by retinal adaptation. Thus also is explained the drop which takes place, pathologically, when the excitability or conductivity of the nervous mechanism is lowered. And it is obvious that, given normal optic conditions of the eye, a diminution in visual acuteness must depend upon some change in the retina, or its direct connections.

I have left out of consideration those visual defects which come from optic errors alone. The explanation of these is simpler. The diffusion circles of the images of objective points are of quite another nature than those which are due to aberration. It is interesting, however, to note in connection with the subject of the lecture that, as a rule, the visual acuteness of an ametrope is relatively better when compared with that of an emmetrope when the light is insufficient to permit of full vision in the case of the latter. This is due, of course, to the absence, generally speaking, in the ametrope, qua his ametropia, of any light sense defect.

Finally, as regards the methods of examination, we have seen that for foveal vision it is easier and, for clinical purposes, sufficient to test the acuteness for Snellen's types under ordinary and reduced illumination and contrast, than to determine the limits of invisibility with the photometer and Mas-

son's disc. We have seen, further, that similar tests are not suitable for the examination of central vision, and that an estimate of visual acuity at other parts of the retina than the fovea must be made with objects which subtend a very small visual angle.

N. M. B.

The Use of Atropin Tablets for the Determination of Refraction in Children.

MOXON, F. (*Lancet*, October 11, 1913). I have more particularly wished to give my experience in this method of atropinization in order to point out the enormous advantage in time and convenience it has over the home use of ointment or drops in dealing with the refraction of school children in school clinics and suchlike centers where many children are collected together at the same time. It necessitates only one visit; whereas with the use of ointment or drops it is the invariable experience, no matter what elaborate instructions, written or otherwise, are given, that at least one or two, and often more, out of every dozen return for refraction, either not having used the ointment at all or only partially so. They are then sent back a second time with a further supply of atropin, which although not used the first time, yet in some way has mysteriously disappeared. Then, again, a certain number of the cases do not return at all, whereas if the tablets have been used on the first visit there is no chance of escape from refraction at any rate. The use of atropin at home, too, is not such an easy matter, especially when it has to be done three or four times a day for several days. It requires not only experience but time and patience, and how often, as one knows, the home and mother are already saddled with a hundred and one other duties.

One further point to which I would like to draw attention is that I have not yet seen any case, when using these tabloids, present any signs or symptoms of atropin irritation or poisoning. As regards actual cost of material, the tablet method compares very favorably with that of ointment or solution, the hospital price of the tabloids working out at about twelve cents for a tube of twenty-five, so that twelve cases can be refracted at a cost of a fraction less than one cent each. Atropin ointment is supplied in two-dram clip-boxes at a cost of one cent each, in addition to which a glass rod for

application has also to be given, and time spent in the dispensing of the ointment or solution.

The author states that complete paralysis of accommodation is obtained in one-half hour with the tablets. N. M. B.

The Conjunctival Flap in Cataract Extraction—A New Procedure. (Bleb Formation and Dissection by Subconjunctival Injection.)

FRIDENBERG, PERCY, New York (*Am. Jour. of Ophthalmology*, Vol. XXI, No. 2), says that the advantages of a conjunctival flap in cataract extraction are that immediate healing is invariably secured, with better coaptation and less post-operative astigmatism. It also guards against prolapse of the iris or inclusion of the pillars. Since it is not always possible to make this flap just as one would like, Fridenberg proposes to prepare it previous to the corneal section by subconjunctival injection of an indifferent or anesthetizing fluid just back of the limbus. He thinks the size of the flap can be better controlled in this way, and the cutting of it made more easily. The fluid is injected near the site of operation, and the corneal section performed at once while the bleb is still present. The needle is entered about 5 mm. back of the limbus, pointing at first toward the center of the pupil. As the bleb is raised it spreads out equatorially as well as toward the cornea. Carrying the needle alongside the limbus the bleb is raised on each side. In performing the operation the flap can be cut through in the usual manner, or the apex can be left attached and the lens delivered into the pocket and then out laterally. E. C. E.

The Uses of Hot and Cold Applications in Ophthalmic Practice.

PETER, LUTHER C., Philadelphia (*Am. Journal of Ophthalmology*, Vol. XXI, No. 2), refers to the doubt which exists as to the discriminate use of hot and cold applications in diseases of the eye. In regard to their action, cold is primarily a depressant. It contracts the vessels, slows the circulation, and checks cell activity. This vascular contraction is followed, if the application is not too long continued, by reaction—i. e., dilatation. By applying cold continuously this reaction, which is not desirable, is avoided. By depressing nervous activity, cold relieves pain. By retarding cell activ-

ity, it lessens microbic growth. Unfortunately the same action tends to lessen cellular resistance.

Heat is a vital stimulant. It dilates the surface vessels and quickens the circulation. It renders cell life more active and in high temperature is analgesic and of some bactericidal value.

Cold applications are best made by means of pads of gauze transferred to the eye from a block of ice, and changed every three to five minutes. It should be applied continuously, but is not usually well borne longer than two days.

Heat is best applied by gauze compresses wet in hot water and changed every ten minutes. It should be applied intermittently, for half an hour at a time, three times a day.

Cold should be applied immediately after severe injuries to the eye, and in the early stages of gonorrheal ophthalmia. Heat should be substituted if the tissues give evidence of lowered vitality. Cold may be used to relieve pain which is apt to be of short duration, as after subconjunctival injections [and after painful applications, such as silver nitrate and copper sulphate.—E.].

In practically all other inflammatory conditions heat is preferable. Heat is superior to cold as a styptic.

E. C. E.

A Modification of Wurdemann's Skiascope.

CROUCH, J. F., AND CLAPP, C. A. (*Am. Jour. of Ophthalmology*, Vol. XXI, No. 2), have modified the Wurdemann skiascope by having the whole series of lenses mounted in the hard rubber holders. By working at half a meter the surgeon holds the instrument in his hand and moves it at will. A total of seven frames is necessary to carry all the lenses.

E. C. E.

Binasal Hemianopsia Occurring in the Course of Tabetic Optic Atrophy.

HEED, CHARLES R., AND PRICE, GEORGE E. (*The Journal of the A. M. A.*, Vol. LXII, No. 10), report an interesting example of this perimetric defect, it being the twenty-first in literature. In three of these, neuroretinitis was present; in two, traumatic optic atrophy; two were optic neuritis associated with brain tumor; two were tabetic optic atrophy; two,

chronic interstitial optic neuritis; two, secondary optic atrophy; one, primary optic atrophy, and one, traumatic optic neuritis. Thus 71 per cent were traced to optic nerve disease. One case was hysterical. The patient whose case is reported by Heed and Price was a male, aged forty-eight years, with tabetic atrophy and vision of 4/60 and 6/60. There was a luetic history, but the Wassermann was negative, probably due to the administration of mercury. The diagnosis of tabes rested on the optic atrophy, slight Romberg, Biernacki's sign, loss of Achilles tendon reflex and lymphocytosis of the cerebrospinal fluid.

E. C. E.

The Operation for Cataract Without Any Anterior Chamber.

LEONIDA, MISS A., Bucarest (Translated from *La Clinique Ophthalmologique*; *Am. Jour. of Ophthalm.*, Vol. XXXI, No. 2), advocates restoring the anterior chamber prior to cataract extraction in cases needing extraction and in which the chamber is obliterated, by injecting salt solution into the chamber. The following is the technic:

After the usual antiseptic precautions in cataract extraction, and after the eye has been anesthetized, we use a Luer syringe with a very fine needle. The eyeball being fixed, the point of the needle is entered at the temporal side exactly at the limbus, and in the horizontal meridian, the needle being held slightly obliquely so as to form an angle of ten degrees to fifteen degrees until it has penetrated through the cornea.

Then it is depressed and pushed forward parallel with the surface of the iris for two to three millimeters into the anterior chamber.

At the same time between one and two cubic centimeters of fluid are injected. Immediately the anterior chamber acquires the necessary depth, and the needle being withdrawn, the operation can be successfully performed. We note that in some cases the pupil, which before the injection was normally three millimeters wide, becomes enlarged up to five millimeters.

E. C. E.

Affections of the Eyes Resulting From Sinus Involvement.

MILLER, ROBT. W., Los Angeles (*Jour. of Ophthalmology and Oto-Laryngology*, Vol. VIII), concludes his paper with the following summary:

1. Sinus involvements are found to explain and clarify the etiology and pathology of many ocular and orbital diseases.

2. Sinus diseases and ocular complications have been especially prevalent in Los Angeles and Southern California the past two or three years.

3. In our examinations special care and repeated efforts are necessary in order to discover the source of the trouble in nonsuppurative and closed suppurative cases of sinus involvement.

4. No part of the eye or its appendages is exempt from secondary invasion from sinus disease.

5. Such cases frequently occur in the epidemic form.

6. Early recognition of the exact nature of such cases is highly important in pointing the way to correct therapy and the conservation of the health and the preservation of the eyes of those who apply to us for relief.

E. C. E.

A Rare Case of Bilateral Optic Neuritis.

BARCK, C., St. Louis (*Am. Jour. of Ophthalmology*, Vol. XXX, No. 11). The patient was a woman, aged thirty-two years, with a failure of vision of two days' duration. The right eye could see movements of the hand, the left was absolutely blind. Her health was good, but some ten years previously her vision was bad during pregnancy. She received no treatment at that time, and the vision returned spontaneously. The pupils were dilated, the right responding feebly to light. The fundus of the right eye was normal, in the left eye typical neuritis optica was seen. No general disturbance of any sort or of any organ could be made out, except that menstruation was overdue one week. She was given mercury, pilocarpin sweats and salicylates, and measures were taken to induce menstruation. In three days the right eye became entirely blind, and an optic neuritis developed. The swelling never exceeded 2 D. in either eye. Menstruation began one week after the first examination, and in a little over a month vision was normal. The fundi became normal in about half that time. There was some contraction of the visual field, but at no time was a central scotoma found. The case was thought to be one of true retrobulbar neuritis, due to delayed menstruation. The right eye was blind thirteen days, the left ten.

E. C. E.

A New Method of Delivering the Lens in Its Capsule.

EWING, A. E., St. Louis (*Am. Jour. of Ophthal.*, Vol. XXX, No. 11). A rather complicated pair of forceps is described, the tips being in the form of loops, spoons, fenestrated spoons or hooks. The idea is to grasp the lens, rupture the zonule by rotating it, and deliver the lens in its capsule. E. C. E.

Glaucomatous Vertigo.

DOR, L., Lyons (*Ophthalmology*, Vol. X, No. 1). A form of vertigo, produced by increased intraocular tension, and analogous in mechanism to Ménière's disease, is described. It occurs suddenly, in direct relation to visual effort. Several cases are reported arising from blind eyes, and relieved by operation for the glaucoma. E. C. E.

Some Striking Examples of Subnormal Accommodative Power.

THEOBALD, SAMUEL, Baltimore (*Jour. of Ophthal. and Oto-Laryngology*, Vol. VII, No. 11). Subnormal accommodation is detected by testing the balance of the extraocular muscles. Compared with the condition at 20' an exophoria of 3° or 4° should be found in the tests made at 12"; i. e., with esophoria 1° or 2° at 20', there should be exophoria of 2° or 3° at 12". If this difference does not exist, that is, if orthophoria or esophoria is found at 12", the ciliary muscle is subnormal, and relief is to be obtained from the asthenopic symptoms by a lasing + 1 or more to the distant correction, with a prism of 3° or 4° base out. Illustrative cases are reported.

E. C. E.

Results in Treating Detachment of the Retina.

DARIER, A. (*Am. Jour. of Ophthal.*, Vol. XXX, No. 12; translated by Adolf Alt). Darier does not think that the recently reported American statistics published by Vail do justice to our therapy as regards retinal detachment. He has seen 108 cases in twenty years, and treated sixty of these due to myopia. Twenty of these improved and six were cured, i. e., the retina reattached. After mentioning all the methods of treatment he describes that of subconjunctival injection of salt solution, which he prefers to mix with the gelatinized

acoin serum of Bellescontre—in the strength of 2 to 6 per cent of salt.

His technic is as follows: No other instrument is needed but a Pravatz syringe armed with a curved platinum iridium needle, 28 to 30 mm. long and well pointed. The needle is flamed before each injection. Of course the syringe and solution must be sterile. The patient need not lie down, nor need he be frightened by a speculum or forceps. The most important point is to cocaine the eye well by three instillations ten minutes apart. The injection must not be made sooner than twenty-five minutes after the first instillation.

The patient, seated in a chair, is told to direct his eyes forcibly downward, and the operation consists in pushing the upper lid backwards with the left thumb, which uncovers the whole upper and outer conjunctival surface of the globe. The needle is then guided superficially between the lid and the globe with its convexity forwards so that it hugs the convexity of the eyeball; the point is slightly held away from the eyeball until the cul-de-sac is reached, then by a slightly rotating motion the needle passes the conjunctiva and then is pushed more and more deeply so that the injected fluid gets behind the equator of the eye.

Thus one avoids that the injected fluid detaches the vascular pericorneal circle and produces affections of the cornea and causes those conjunctival eschars which have been pronounced as due to badly made injections. When it is necessary to inject more considerable quantities of fluid (massive injections of 2 to 6 cc., Jones) we must be very careful to penetrate with the needle as far as possible into the retrobulbar tissue. "I should not recommend to try and penetrate into Tenon's capsule; it is more useful to inject farther back near the apex of the orbit."

The injection is repeated after the chemosis subsides, and the patient is kept in bed a month. If no improvement occurs the dose of salt is increased, and leeches, cupping and sweating are carried out. In syphilitic subjects cyanid of mercury 1/1000 is used subconjunctivally. The surgical treatment is one of gravity and risks.

E. C. E.

**Commission on the Conservation of Vision—Report of
the Chairman.**

POSEY, WILLIAM CAMPBELL, Philadelphia (*Ophthalmic Record*, December, 1913). The Commission for the Conservation of Vision was established at the last session of the Pennsylvania State Society, and has been formed with Dr. William Campbell Posey as its chairman. It consists of ten ophthalmologists and ten lay members.

Posey formulates the opinion that the success of the conservation of vision movement must primarily be through the work of ophthalmologists operating through their state societies and in conjunction with state health boards, laymen, etc. It is expected that plans will be made in the future whereby a commission similar to that of Pennsylvania may be established in each state, and the whole brought under the management of a central board, with headquarters in the offices of the American Medical Association. A committee of the Section on Ophthalmology of the American Medical Association might form the nucleus of such a central board.

Posey describes the machinery for prevention now existing in Pennsylvania, and urges a plan whereby the health authorities can command the services of ophthalmic surgeons, so that these cases on being reported may be immediately attended by an ophthalmologist. All cases of ophthalmia neonatorum are reportable.

Question of trachoma is taken up, and the establishment of hospital schools is urged. The number and location of all cases of trachoma should be obtained.

Radical measures in safeguarding the eyes of employees in manufacturing establishments are necessary.

The so-called optometry bill was last year defeated in the legislature.

The commission, through a subcommittee, urges a longer course of study in ophthalmology in the postgraduate schools.

An investigation regarding blindness from alcohol poisoning is projected.

The ophthalmologists of the country should be enrolled into an efficient organization for preserving vision, and education of the public must be sought for.

G. S. D.

The Visual Requirements in Railway and Traction Services, and the Protection of the Eyes of Workmen in Large Shops.

CHANCE, BURTON, Philadelphia (*Ophthalmic Record*, December, 1913), describes the requirements in force on the Pennsylvania railroad. Employees must pass a satisfactory examination. They must have sufficient vision to distinguish, without the aid of glasses, prescribed signals and to tell the colors. At the end of five years, each employee must be again examined until after the age of forty, when he must be examined every two years. In later examinations the employee may wear glasses. All candidates for the position of conductor or engineman must pass a satisfactory physical examination.

Examinations are conducted by members of the medical department and by skilled laymen; and where there is any doubt as to the visual qualifications of the candidate, he is referred to the ophthalmic surgeon.

Color tests include recognition of flags, train lights, hand lanterns, etc., in the field; and indoor examination with colored skeins and the Thompson lantern. Various degrees of acuteness of vision are necessary, which are given in the article.

Chance then describes standards maintained for electric and trolley lines, and goes on to speak of precautions observed in large industrial works, such as the United Steel Company, Baldwin Locomotive Works, etc.

Men employed as chippers in the casting yards are urged to use goggles; for heavy chipping they must use wire face masks. Compulsory wearing of goggles is enforced among the men who pour molten metal. Face shields are provided for those who work with the electric arc. Spark shields and hoods are attached to machinery to arrest flying particles.

Chance notes the hygienic improvement in the modern factory over the old shop.

G. S. D.

Ophthalmia Neonatorum.

HOLLOWAY, T. B., Philadelphia (*Ophthalmic Record*, December, 1913). Cohen believes that the direct and indirect cost of ophthalmia neonatorum to the United States amounts to a yearly expenditure of \$1,800,000. Mayou states that in England it costs £350,000 to educate and care for children

blinded by this disease. In 1913 the Pennsylvania legislature appropriated \$123,300 for institutions or organizations for the blind.

The yearly per capita appropriation for the pupils in the schools for the blind in Pennsylvania is approximately \$305. It is contrasted with \$2.35 appropriated by the state for children with sight in the public schools. The yearly cost of educating a pupil in the school for the blind is \$400, for a seeing child \$34.71, in Philadelphia.

The ophthalmia neonatorum bill passed in Pennsylvania requires a report within six hours after the diagnosis; also, that a physician within forty-eight hours after ceasing attendance on such a case shall report the condition of the eyes to the commission of health.

All midwives are required to obtain a certificate from the Bureau of Medical Education.

Statistics as to the prevalence of ophthalmia neonatorum are given.

Question of compulsory prophylaxis is taken up, and advance along this line is urged in Pennsylvania. Holloway recommends a 1 per cent solution of nitrate of silver, which should be used by physicians in all cases in the presence of the gonococcus, or in all suspected cases.

He calls attention to the scarcity of beds in the Philadelphia hospitals for the treatment of ophthalmia neonatorum.

He urges a law compelling births to be reported within twelve hours, so that instructions concerning ophthalmia neonatorum may be immediately forwarded to the parents.

G. S. D.

A Case of Late Infection After Elliot's Trephining.

GIFFORD, H., Omaha (*Ophthalmic Record*, January, 1914). The first case of late infection after Elliot's operation was noted by Wagenmann in 1912. Since then twelve additional cases have been reported. The following features are noted: Buttonholing of the flap, epithelial defects in the conjunctival flap, plastic iritis, panophthalmitis, purulent iritis, late infection following a conjunctivitis; in several cases the eye was a total loss.

Similar infections have been noted after the iridosclerectomy of Lagrange.

Gifford has trephined in thirty cases, and has seen one late infection. The eye operated on had greatly reduced vision as a result of iridocyclitis. Tension, 40 mm. The eye was trephined and an iridectomy performed. A week after the operation membrane covering the opening was unusually thin. Two weeks after operation, marked catarrhal conjunctivitis developed, with a slight amount of pus in the anterior chamber, the course of which could be traced from the trephine hole. Under treatment the eye improved, but is still considerably inflamed.

Gifford calls attention to the fact that the more successful the operation from the standpoint of the reduction of tension, the more danger of late infection. Where the scar flattens out and filtration apparently ceases, infection does not occur.

Neither Lagrange nor Elliot have seen a case of late infection. Gifford notes that they both advise making a thick flap in their operations.

Can a thick flap be obtained without disturbing the efficiency of the fistula?

Gifford urges that these patients should be warned to pay especial attention to the hygiene of the conjunctival sac.

The occurrence of late infection is no warrant for discarding the operation, but raises a doubt as to whether fistulizing operations are advisable in acute glaucoma, or whether it is not best to wait until an ordinary iridectomy has first been performed.

He calls attention to Meller's article, where out of 389 sclerectomies (Lagrange) 1.3 per cent of the eyes were lost; and in 178 Elliot operations late infection was not observed, although 2.4 per cent of bad results were obtained as opposed to 10 per cent of bad results with Lagrange's operations.

Gifford predicts sympathetic ophthalmia following this operation.

G. S. D.

A Few Remarks on Trephining.

DENIG, R., New York (*Ophthalmic Record*, January, 1914), has done twenty-one trephinings and witnessed fifteen more. He believes that in this operation it is easier to grasp the base of the iris than in the ordinary von Graefe operation. The danger, however, of late infection is very serious. Fourteen cases have so far been reported.

On this ground he is in favor of doing iridectomy in cases

of acute glaucoma, except in those having a very shallow anterior chamber.

He believes in iridectomy for subacute glaucoma, and reserves trephining for simple and hemorrhagic glaucoma.

Trephining has been very satisfactory in cases of iritis with secondary tension, and he advises in these cases the formation of a very thick conjunctival flap to avoid the possibility of late infection.

Trephining also should be used for cases of detached retina.

He has trephined once in inflammation of the uveal tract, and in this case the hole in the sclera closed up about three weeks after the operation. In doing the operation the disc should be freed cleanly all around without the use of scissors. Iridectomy should be added. If the iris does not prolapse, Denig considers it dangerous to pull it out by means of forceps. Care should be taken in the formation of the conjunctival flap, and two loose sutures laterally should be placed to hold it in position.

G. S. D.

Sclerocorneal Trephining in Glaucoma.

PETER, LUTHER C., Philadelphia (*Ophthalmic Record*, January, 1914), describes the various operations for glaucoma. The advantages of the trephining operation are: First, simplicity of technic; second, the absence of trauma; third, permanency of drainage; fourth, applicability to every form of glaucoma.

Sharp cutting edge is the first essential of a trephine. Peter has used first the ordinary trephine, then the von Hippel spring trephine, and recently Reber's trephine driven by a dental engine. A sharp instrument driven by moderate speed removes the disc cleanly and produces the minimum amount of trauma. Two millimeter opening should be made.

Peter believes that this is the operation of the future in all forms of glaucoma and in any stage. The value of the operation as a prophylactic cannot be overestimated.

He is in the habit of operating on both eyes at the same sitting in simple glaucoma.

The conjunctiva should be separated from the cornea, rather than splitting that membrane. Atropin should be instilled at the end of the operation and on three successive days. The

flap should be held out of the way with a cotton swab. A stitch should be inserted at the end of the operation.

G. S. D.

A Theoretic Consideration of Some Phases of Sympathetic Ophthalmia.

GIFFORD, H., Omaha (*Ophthalmic Record*, February, 1914). In an illuminating, scholarly and interesting manner, Gifford reviews the features of this disease with special attention to the latest theories. The failure to discover germs in eyeballs affected by sympathetic ophthalmia has "led to theories from which microbes, as a direct exciting cause, are largely or completely omitted." Brown Pusey was the first to enunciate such a theory.

Castaigne and Rathery found that when the pedicle of one kidney of a rabbit was ligated and the degenerating kidney left in place, well-marked degenerative changes in the opposite kidney occurred; while if the kidney was removed, no such changes occurred.

Pusey applied this observation to sympathetic disease, and supposed "that when a damaged eye degenerates in the orbit, the cells of the eye (probably the lining cells of the ciliary processes and the iris) can give rise to a specific cytotoxin, which, circulating in the blood, picks out the cells of the fellow eye and may cause changes which we now designate as sympathetic ophthalmia."

A year later Golowin proposed a similar theory, adding that the eye injured by toxins more easily became the prey of germs circulating in the blood.

Anaphylaxis was next applied to sympathetic ophthalmia in the views of Elschmig and Kümmell, based on the general views of Bail and Heim, respectively.

The first eye is injured by trauma, and it becomes infected with one of the ordinary bacteria, or develops a nonbacterial inflammation. The disorganization of the tissues leads to absorption of uveal tissue. The part of the uvea not affected by injury becomes sensitized, and as a result of this a uveitis in both eyes supervenes. As yet, this theory has found very little support in fact.

Gifford cannot see that it offers any great advantage over previous theories, and points out that its most important

defect is the fact that sympathetic ophthalmia occurs almost exclusively after penetrating wounds.

The histologic picture of the disease is also a strong argument against this form of origin, as an infectious granuloma such as is found here can hardly be due to other than microbic action.

The microscopic picture has several times been pronounced tuberculous by well-equipped general pathologists, purposely kept in ignorance of the clinical features of the case.

The course of sympathetic ophthalmia is different from that of the ordinary anaphylactic inflammation, which is explosive in character. The anaphylactic theory would not explain the occurrence of sympathetic optic neuritis.

Gifford criticises Elschnig's view, suggesting that enucleation of the exciting eye can be of no use after sympathetic inflammation has once broken out. He believes that it should always be enucleated "whenever there is any reasonable prospect of its obtaining useful vision."

The influence of mercury and the salicylates also point to a microbic origin of the disease.

Gifford mentions the suggestion of Domann, that lumbar puncture should be made in these cases to determine whether a slight meningitis exists.

Gifford believes that the germ theory of Leber and Deutschmann has unjustly fallen into discredit. The slight evidence of the passage of germs along the optic nerve sheath is not hard to explain, as one would expect this in a microorganism with only slight pathogenicity for this tissue. Optic neuritis occurring in sympathetic disease is hard to explain, except on the theory of transmission by the nerve sheath, but it is unnecessary to suppose that the passage of the germ from one eye to the other is always by the same route.

The theory of Meller, that the organism occurs commonly in the blood, and that the infection of the first eye is from the blood stream, contends with the fact that the disease nearly always occurs after a penetrating injury.

In regard to the occurrence of sympathetic disease after supposedly nonpenetrating injuries, it may now possibly be explained by the facts coming to light in connection with late infections after the trephining operation for glaucoma. In these cases it is probable that a minute lesion of the conjunctiva really occurs.

Gifford says that many of the important observations brought out in the classical paper of Fuchs have been previously made by Schirmer, Uhr and Ruge, and that too much credit has been given to the former author for his work.

Gifford applauds the present nomenclature used, and says that some attempt to reform the continental practice should be made. The terms "sympathizing eye" and "sympathized eye" are misleading, and do not truly represent the conditions. English speaking ophthalmologists should take action for themselves and adopt some definite terms for the designation of the first and second eye. He believes that some new term must be evolved to designate an inflammation of the first eye which may cause sympathizing of the second. "Sympathogenic" is suggested, and possibly some equally good or better term could be found.

This paper should be read in the original. G. S. D.

Report of a Case of Glioma of the Retina in a Jamaican Two Years Old.

REEDER, D. F., Ancon (*Ophthalmic Record*, February, 1914). A Jamaican, two years old, blind all his life, showed an enlarged right eye which protruded between the lids and which finally ruptured, producing a large, bleeding, cauliflower-like mass. It was enucleated.

Ten days later the left eye, which had become enlarged and painful, was also removed. Later metastasis developed in the head, neck and liver.

The writer regards gliomasarcoma as the correct terminology of this neoplasm. A very extensive pathologic report and excellent photographs of the case are given.

Wilson and Thompson note that in 530 cases metastasis was recorded sixty-one times; seven times in the liver; and the other organs are usually cranial and facial, bones, brain, lymphatic glands and the parotid glands. G. S. D.

Salvarsan and Neosalvarsan in the Treatment of Syphilis, With Special Reference to Diseases of the Eye.

UHLE, ALEXANDER A., AND MACKINNEY, WILLIAM H., Philadelphia (*Ophthalmic Record*, February, 1914). The writers emphasize that considerable reliance may be placed on the quantitative Wassermann reaction in the prognosis and

the treatment of syphilis. It offers the most reliable index of treatment.

They have analyzed twenty-five hundred injections given to about one thousand syphilitics. The only unpleasant effects that they have met with, and been unable to eliminate, are nausea, occasional vomiting, flatulency, diarrhea, and toxic erythema. Nausea and vomiting are much less frequent when the injections are given on an empty stomach and food withheld for eight hours after.

The most important contraindication to the administration of salvarsan is nephritis. In its immediate effect, mercury cannot compare with salvarsan or neosalvarsan. Little difference has been observed between the action of salvarsan and neosalvarsan.

Out of the total number of cases seen by the writers, sixty-two came because of syphilitic disease of the eye and of its appendages. Fifty of these are reported upon. On ten cases of interstitial keratitis—six of the hereditary and four of the acquired type—injections were used.

A good final result was obtained in all cases in from two weeks to three months. The clearing of the cornea is slow, but, as a rule, definite after each injection. This form of disease should be treated with repeated injections at short intervals.* The results are astonishing in acute syphilitic manifestations. Consistent improvement was noted in the muscle palsy, and the results were uniformly good in optic neuritis.

G. S. D.

The Hard Plug Method of Controlling Hemorrhage Deep in the Orbit, as Illustrated in a Case of Aneurismal Varix.

GIFFORD, H., Omaha (*Ophthalmic Record*, February, 1914). Patient, healthy man of thirty-two years, with a history of a lime burn of the left eye two years previously, showed a small bluish spot in the skin just below the left lower lid which was getting larger.

An attempt had been made to excise this spot, and terrific hemorrhage was met with. Exophthalmus was developing, and there was marked ulceration of the cornea and signs of beginning panophthalmitis.

*The success of the writers in this disease differs considerably from that met with by many other observers.—Reviewer.

Patient was sent to the hospital, and a sudden severe hemorrhage occurred, which was checked by pressure, but recurred several times. On cutting down, a dark purplish vessel nearly three-sixteenths of an inch in diameter was found. This was tied off.

Later the eyeball was enucleated, and a vessel one-eighth of an inch in diameter was followed back into the orbit and tied. Lids then filled up with extravasated blood. Skin became gangrenous. Wound opened and the blood clots scooped out. Bleeding vessel found and tied off at the back. Cavity was tightly packed. Pressure bandage was applied, but severe bleeding again occurred after a few days. The orbit was then eviscerated. The same large vessel met with again at the apex. Pressure on the carotid to control hemorrhage, and the orbit was packed. Bleeding then occurred in six days, which could not be controlled by ligature or cautery.

Gifford then sterilized a cylinder of wood, three-fourths of an inch in diameter and three inches long, and after applying a swab of iodoform gauze dipped in Monsel's solution to the apex of the orbit, pressed down with the cylinder. Gauze was then packed around it, and a firm bandage applied. Bandage was tightened three times a day. A hard plug was used for ten days and patient had excessive pain. Small area of bone necrosis delayed healing, but no further difficulty was encountered from hemorrhage.

G. S. D.

Table Instead of a Chart for a Tonometer.

ELLETT, E. C., Memphis (*Ophthalmic Record*, February, 1914), has worked out a small and satisfactory table which may be used to replace the ordinary tonometer chart.

G. S. D.

Two Useful Remedies in the Treatment of Diseases of the Conjunctiva.

THOMPSON, R. L., Spokane (*Ophthalmic Record*, February, 1914). Xeroform, in the hands of the writer, has cured three cases of vernal catarrh, applied in the powder to the diseased surfaces twice a day. Similar success was met with in recurrent pterygium.

Tannic acid dissolved in glycerin is used by him for "follicular conjunctivitis with pannus." Eversion and thickening of the lower lids also yield readily to this remedy. G. S. D.

The Prism Dioptry Establishes a Dimensional Unit at the Optic Chiasm.

PRENTICE, CHARLES F., New York (*Ophthalmic Record*, February, 1914). The author is the president of the New York State Board of Examiners in Optometry, and special lecturer on Theoretic Optometry, Columbia University, New York. The problems raised by him in this article have been food for thought by most of the leading students and writers on physiologic optics from the beginning. Hering is the greatest single contributor to the solution of them, but Helmholtz devotes more space to them in his book than to the entire subject of dioptries. It is a pity that in an article proposing to "portray somewhat differently certain fundamental principles," no summary of the views of his predecessors is given as a starting point, so that the reader may approach the new speculations with a proper perspective.

"In the interest of lucid illustration," the writer assumes the existence of "a figurative chiasmal image," in order to elucidate the well-known problem of how the two retinal images, one for each eye, are fused so that they are seen as one. "It is not intended to convey the idea that an image, in its strictest sense, is located at the optic commissure; but it shall signify that orderly assemblage of the optic nerve fibrils within the crosssectional and comparatively small area of the optic chiasm which receive their individual stimuli from corresponding points in each retinal image."

A cursory examination of the well-known authorities would show that the value of some such imaginary central image as an aid in picturing to ourselves how the two separate retinal images are combined, was early appreciated. In fact, the first theory was just this—that the chiasm was the key to the problem. It was proposed by Galen, in the second century, and adopted by Newton and many others.*

The best and generally accepted way of looking at it is the one proposed by Hering, of an imaginary single eye between the two real eyes, for which Helmholtz suggested the appro-

*Galen, *De usu partium*, Lib. X, cap. 12. I. Newton, *Opticks*, 1717, p. 320, Query 15. Rohault, *Traité de physique*, Paris, 1671 and 1682, Part 1, cap. 31. Hartley, *Observations on Man*, 1, 207. W. H. Wallaston, *Phil. Trans.*, 1824, 1, 222. Joh. Müller, *Zur vergleichenden Physiologie des Gesichtssinns*, Leipzig, 1826.

priate name of "Cyclopean eye." This has all the advantages of the imaginary chiasmal image for the special problem here considered, and also is a useful help to the understanding of some of the problems of ocular movements and innervation, muscle sense, direction of projection, torsional movements of the eyes. It is more in accord, too, with the fact that the same pair of points on the two retinas can in one case be corresponding or identical points and so fused in single vision, or again be disparate points and not fused but seen double.

Prentice states that "with this conception of the chiasmal image, orthoscopic binocular vision may be said to require absolute equality in the dimensions of the retinal images, in order that these identical images, when conveyed by the optic nerves, may exactly cover each other at the optic chiasm." This is very misleading, for it is an important and interesting fact in the laws of binocular vision that equality of the size of the retinal images is not necessary. On the contrary, we continually and easily fuse images which are unequal in size, not only in cases of anisometropia, but with normal eyes, when, for example, we look at a near object situated over to one side so that it is nearer one eye than the other and therefore its retinal image is larger in one (the nearer eye) than the other.

The more you study into the problems the more the cyclopean eye seems to be preferable to the chiasmal image. The figures given by Prentice apply equally to this conception, even the letter C applying to either.

Prentice proposes "to reveal another application of the prism dioptry in physiologic optics." The prism dioptry is a convenient unit for the numeration of prisms devised by Prentice in 1890 and, since 1895, adopted by all manufacturers of prisms in the United States. A prism of the strength of one prism dioptry will cause an object at the distance of one meter to appear displaced at 10 mm. If an eye deviates so that its image of an object at one meter distance appears displaced 10 mm., the deviation may be expressed as one prism dioptry. Now since the focal length of the reduced eye is 15 mm., the size of the retinal image of an object 10 mm. square at 1 meter distance would be 0.15 mm. (Size of object : size of image :: distance of object : distance of image.) "Therefore it has been conclusively demonstrated

that for each prism dioptre of deviation between the visual axes there is a separation of the image centers equal to 0.15 mm."

One other thing the writer proposes, and that is "to make a disclosure respecting the acuteness of visual discrimination at the optic chiasm." This is a demonstration by the usual method, using the reduced eye, of the simple fact that when the deviation of the optic axes equals the width of the object looked at (for example, a 10 mm. object at 1 m. distance, in which case the deviation equals 1 prism dioptre), the two images will appear displaced so that their edges just touch; if the deviation is greater, they will appear separated by a clear space; if the deviation is less, they will overlap.

G. S. D.

Some New Instruments for Measuring Visual Field Defects.

WALKER, CLIFFORD B., Boston (*Archives of Ophthalmology*, November, 1913), doubts the accuracy of mechanical perimeters, especially when the field defect approaches close to the center. They are time-consuming, and color readings cannot be taken rapidly for different colors.

For taking fields he has perfected round discs with a knife-edge rim and a very narrow handle, and has measured them in terms of areas. His discs vary from one-sixty-fourth of a square centimeter up to sixteen square centimeters.

He describes an ingenious color interchanger on which the colors can be instantly varied without the knowledge of the patient. The advantages of such an instrument are obvious.

A well-devised blinder is described which can be sterilized, to which may be attached a long, cone-shaped tube, which Walker terms a macula selector; or a rotating mirror may be attached, by either of which instruments fixation may be secured by means of the good eye, while the field of the other eye where central vision has been lost may be taken.

G. S. D.

On Some Forms of Retinal Tuberculosis.

KNAPP, ARNOLD, New York (*Archives of Ophthalmology*, November, 1913), states that in addition to cases of retinal periphlebitis with either retinal or vitreous hemorrhage, occurring in adolescents, and cases of massive retinal exudation

somewhat like the exudative retinitis described by Coats, there is a group of retinal lesions in the tuberculous where the more superficial layers of the retina are involved.

Case 1.—Nineteen years old. Showed a vision of 5/200 in the right eye and central scotoma. Ophthalmoscope showed a swollen optic nerve head. It seemed to be displaced by a chorioretinal area down and out, which was surmounted by a small hemorrhage. Down and in, next to a blood vessel, there was a superficial, round, white focus. Another smaller, though similar patch, was seen below. There was a star-shaped figure in the macula region.

After a diagnostic injection of 3 mg. of old tuberculin, temperature rose to 100.4,° and two days later there were many small, round, white areas about the disc which were deep in the retina.

Tuberculin treatment was followed by a very marked improvement. Vision improved to 15/200. Central scotoma remained.

Knapp regards the exudate near the disc as a probable tubercle of the retina, such as is illustrated in Adam's Atlas. He calls special attention to the group of small, white exudates, like miliary tubercles, which appeared after the diagnostic injection; and notes that they are frequently observed in various forms of retinal tuberculosis. It is uncertain whether the tuberculin injection made these areas visible with the ophthalmoscope, or whether they represented an extension from the original focus.

Case 2.—Twenty-two years old. Vision, right eye, 8/200. Central scotoma. There was a white exudate composed of rounded areas that surrounded the course of a macula vein, which was unevenly dilated. Two small hemorrhages were seen. Diagnostic tuberculin injection followed by a temperature and vitreous haze. Tuberculin treatment was begun. Process progressed up along the veins, with considerable edema and swelling. Vitreous became cloudy. Gradually the exudates became absorbed, replaced by connective tissue. At the end of six months there was a healing process, with a clear vitreous.

Knapp regards the course of this case as favorable, and believes that the tuberculin treatment had much to do with it.

G. S. D.

Discission of the Crystalline Lens.

JACKSON, EDWARD, Denver (*Archives of Ophthalmology*, November, 1913). Complete steadiness of the eyeball is extremely important for the needling operation. The needle should be introduced through the vascular limbus, through the outer and lower portion. The first attack would be a simple puncture, and is a "test discission." After this the capsule may close and the lens remain clear, or even a complete absorption of the clear lens may follow. The puncture in this case should be carried to the very center of the lens nucleus, especially in older children and adults.

If the first operation has caused marked swelling and opacity of the lens, the second operation should aim at disintegration of the lens nucleus. The needle should be introduced into it, and turned to cut up and down. If the effect of the first needling has been slight, a more extensive operation may be performed the second time than in an eye where considerable reaction has taken place.

In young children three operations are usually sufficient; in older patients more. In young children six months should be allowed to obtain the desired results; in adults, a year.

G. S. D.

On the Pathogenesis of Scleral Staphyloma.

MATTICE, ALBERT F., Seattle (*Archives of Ophthalmology*, November, 1913). Staphylomata always originate at some point where the resistance of the sclera is less than normal, due to previous inflammation or to a local weakening at the point of entrance of vessels and nerves. Examples are: deep scleritis, malignant tumors, and tuberculous foci. The scleral fibers possess little elasticity and break off quickly in the application of much pressure; and in this manner successive layers are broken through.

Mattice describes the pathologic examination of the right eye of a man, seventy years old, who had a large central leukoma, increased tension and enlargement of the eyeball. The staphyloma found had no connection with the point of entrance of blood vessels, and no inflammatory changes could be demonstrated.

He believes it originated from a groove formed in the sclera by the pressure of a ciliary artery, and assumes that it was preceded by a slight anatomic weakness. G. S. D.

A Communication Upon the Weight of Infants' Lenses and Their Solids.

CLAPP, C. A., Baltimore (*Archives of Ophthalmology*, November, 1913). The average age obtained is six weeks, average weight .0953 gm., and the average weight of solids .0265 gm. Clapp concludes that the weight of infant lenses is subject to comparatively wide variation, but, on the whole, is somewhat less than that usually given; and the per cent of solid is less than that for an adult, being on the average 27.57.

G. S. D.

Enneclation With the Implantation of Hollow Gold or Glass Sphere—A Plea for Its More General Adoption.

GREENWOOD, ALLEN, Boston (*Archives of Ophthalmology*, January, 1914), urges the advantages of this operation, and believes that a glass sphere of considerable size should be introduced—22 mm., if possible. After this is introduced Tenon's capsule is sutured over it, and the muscles are then sutured over that. Finally, an interrupted suture of the conjunctiva is made at right angles to the palpebral fissure. Cosmetic advantages are great.

Greenwood prefers glass, on account of its cheapness and lightness. It should be entirely free from lead. G. S. D.

On Some Practical Points Connected With the Operative Treatment of Glaucoma.

JOHNSON, G. LINDSAY, Johannesburg, South Africa (*Archives of Ophthalmology*, January, 1914), discusses difficult situations in glaucoma. When the tension is high and the patient refuses to submit to immediate operation, he douches the eye with warm boracic acid, and inserts a sterilized, double-edged, broad needle through the eyeball as far as the center, allowing one or two drops of vitreous to escape. This is followed by almost immediate relief of tension. An iridectomy may thereafter be performed at one's convenience.

In cases where the tension rises after an iridectomy, Johnson describes his own favorite procedure. This is the punching out of a small piece of sclera and cornea at the limbus by a special instrument, which will cut a piece of any length up to 8 mm. and 2 mm. in width.

He believes that this operation is superior to Elliot's. The exact technic may be read in the original. G. S. D.

The Absence of Cicatrization of the Iris After Operation or Injury.

McBURNAY, MALCOLM, New York (*Archives of Ophthalmology*, January, 1914). Fuchs has pointed out that injuries to the iris when hemorrhagic infections are absent show little tendency to scar formation.

The object of the writer is to record some cases which demonstrate this fact. He records eight, in most of which an iridectomy was performed some years previously. In none of these does the cut edge of the iris show scar tissue. In one case, a successful cataract with iridectomy of four days' duration, there was a slight exudate present. This was also present throughout the anterior chamber, and the writer regards it merely as a normal constituent of the newly formed aqueous.

McBurney offers the following explanation for scar formation: Proliferation of tissue is necessary. Proliferation presupposes the presence of an irritant. In the absence of this irritant, no reaction takes place, and it must be considered that such an irritant was absent in these cases. In other words, neither the trauma alone, nor the action of the aqueous, is capable of stimulating the tissues to exudation.

G. S. D.

A Case of Sarcoma of the Lacrimal Sac.

BUTLER, T. HARRISON, Birmingham, Eng. (*Archives of Ophthalmology*, January, 1914), has found but one similar case, by Sylvester, quoted by Weeks. The tumor was extirpated, but recurred in the orbit and parotid region.

The writer presents the case of a girl, seventeen years old, complaining of epiphora. There was edema and thickening around the left lacrimal sac and roof of the nose. Duct was occluded. Nothing abnormal in the nose. Diagnosis of tuberculosis of the sac was made.

Operation showed a tumor in the place of the lacrimal sac, which extended upward from the roof of the nose, and measured $2 \times 1 \times \frac{3}{4}$ of an inch. Microscopic report was small round cell sarcoma.

A recurrence of the growth developed in the orbit which was extirpated. The growth again recurred. Exenteration of the left orbit was performed, but extension of the growth took place in various situations, from which it disappeared, reappearing in others; and the patient finally died.

G. S. D.

Metal in the Eye After Magnet Extraction.

MATTICE, ALBERT F., Seattle (*Archives of Ophthalmology*, January, 1914), takes up the subject of metal remaining in the eye after an apparently successful magnet extraction. Two cases are described, and the conclusions drawn that it is impossible, even after a most successful magnet extraction, to be sure that all the metal has been removed from the eye.

In these two cases, after magnet extraction enough metal remained to produce a siderosis. The metal appeared in microscope sections in the form of scale-like particles.

Iron slivers obtained from the waste material of a forge were examined, and it was found that none of them have a smooth surface, and on moderate friction gave rise to a fine powder. Mattice believes that these minute particles may give rise to more or less functional deterioration. G. S. G.

A Note on the Progress of Some Cases of Retinitis Pigmentosa Sine Pigmento and of Retinitis Punctata Albescens.

NETTLESHIP, E. (*The Royal London Ophthalmic Hospital Reports*, Vol. XIX, Part II, January, 1914). Retinitis pigmentosa without pigmentation visible in ophthalmoscopic examination, and to be diagnosed, therefore, only by the condition of the disc and retinal vessels and the sometimes equivocal changes due to alterations of the pigment epithelium, is not common, and, even when seen, there appears to be some doubt as to its explanation. He here reports two cases which he has followed for a long time in typical retinitis punctata albescens, and reports having had the opportunity of examining the fundi of three cases for periods varying from eight to twenty-seven years. In one case, watched for twenty-seven years, the changes appeared to be exactly as they were at the first examination, but in the other two instances, a brother and a sister, the appearances had altered. The dead white retinal dots became less numerous in the sister. In the brother, who is older and has been under observation for twenty-six years, they disappeared entirely between the ages of thirty-nine and forty, and characteristic pigment collections begun to appear in the retina. In both the usual appearances at the optic discs were obvious, and in the sister there was marked shrinking of the retinal vessels. This last case is important, as prov-

ing that the most typical picture of retinitis punctata albescens may remain in appearance unchanged for many years—at least eighteen in this instance—and then give place to the well-known changes of choroidal sclerosis and commencing typical retinitis pigmentosa. Although instances of typical retinitis punctata albescens and of retinitis pigmentosa have been recorded by several authors as occurring in different members of the same family, I have not met with any account of a case such as the present one in which the characteristic appearances of the one condition have been observed to pass into those of the other in the same patient.

W. E. B.

On the Inheritance of Retinitis Pigmentosa, With Notes of Cases.

USHER, C. H. (*The Royal London Ophthalmic Hospital Reports*, Vol. XIX, Part II, January, 1914). That retinitis pigmentosa is an hereditary disease has for long been known but to what degree or in what percentage of cases inheritance can be found has yet to be determined, and not until a very large number of unselected pedigrees, including those in which only single cases occur, have been worked out can this be settled. Charts are given of forty new pedigrees of sixty-nine unselected and nearly consecutive cases of this disease. The Wassermann test was made on thirty-five individuals, twenty-eight of which were negative and seven positive. Of the sixty-nine cases, forty-two were males and twenty-seven females.

The age of onset is frequently indefinite, but as nearly as can be determined was as follows:

From 1 to 5 years.....	10 cases
From 6 to 12 years.....	24 cases
From 13 to 19 years.....	5 cases
From 20 to 30 years.....	6 cases
From 31 to 50 years.....	3 cases
After 50 years.....	1 case
"Always had bad sight" or "never saw so well as others in dim light".....	12 cases
Uncertain	2 cases
Total.....	63 cases

He also gives a table of the order of birth of the retinitis pigmentosa cases.

There are seventeen childships in which two or more cases of retinitis pigmentosa occur; in seven of them the affected persons do not come consecutively in order of birth, being in each case separated by one or more siblings unaffected with retinitis pigmentosa. In one family there are three children with retinitis pigmentosa, and in another family two, yet none of the affected individuals occur together. In the remaining ten childships, affected members occur together in groups of two, three and four, and in six of these childships there are also single cases of retinitis pigmentosa, separated from an affected group by one or more normal individuals.

Thirteen, and possibly fifteen, of the sixty-nine examined cases may be regarded as mentally affected.

Vision varies from 6/9 to no perception of light in six cases. Illnesses and other conditions that may have a bearing upon the etiology of retinitis pigmentosa are given. Most published cases, whose origin is attributed to syphilis, seem to be unioocular. The fields of vision are recorded in fifty-three cases. Ring scotoma was present in eight. A vascular origin as a cause of the scotomata in a case is suggested by the presence of Raynaud's disease, and it is tempting to attribute the vacillating character of the scotomata in this case to spasm of the ciliary arteries. This would accord with the vascular theory of retinitis pigmentosa that attributes the cause to diminished blood supply in the choriocapillaries. Spasm of the retinal arteries in Raynaud's disease and other affections is the explanation given by a number of authors for certain ophthalmoscopic appearances seen by them. If spasm of the retinal arteries can occur, it seems no less likely that spasm should occur in the ciliary arteries. As other indications of possible vascular origin he mentions cases of senile gangrene and others with cold hands and feet.

Night blindness is noted as being present in fifty-seven cases. There is no mention of it in ten, and in two cases it is absent. In this series five eyes in three individuals, examined ophthalmoscopically and found on first examination to be without pigment in the retina, developed typical appearances of retinitis pigmentosa, as seen on subsequent examinations.

In reference to consanguineous marriage as a factor in

causing the disease, there are in this group ten first cousin marriages in parents of retinitis pigmentosa cases and five consanguineous marriages among the grandparents.

W. E. B.

Primary New Growths of the Lacrimal Gland.

GREEVES, R. A. (*The Royal London Ophthalmic Hospital Reports*, Vol. XIX, Part II, January, 1914). Tumors of the lacrimal gland may be divided into two main classes: (a) Mixed tumors; (b) tumors, the main histologic feature of which is an overgrowth of small round cells in the gland stroma.

Those belonging to class (a) are never multiple. They occur in adult life, are of slow growth, do not recur locally if completely removed, nor do they give rise to metastasis in the lymphatic glands or elsewhere. A fatal issue has been reported in some cases, owing to the direct spread of the growth to the meninges.

Class (b) includes tumors arising in one gland only, as well as multiple enlargements of the lacrimal and salivary glands, the microscopic appearances in all these cases bearing a strong resemblance to one another.

Of the unilateral single tumors, all have been described as sarcomata, but the clinical features in the majority of cases have not supported this diagnosis. That small round celled sarcoma of the gland may, however, occur is shown by an undoubted case reported here.

It is possible that inflammatory and secondary enlargements of the gland are included among the cases in this group.

There is no evidence of the occurrence of true adenomata and adenocarcinomata of the lacrimal gland. W. E. B.

Serous Detachment of the Choroid and Ciliary Body as an Accompaniment of Perforating Lesions of the Eyeball.

HUDSON, A. C. (*The Royal London Ophthalmic Hospital Reports*, Vol. XIX, Part II, January, 1914). The writer comes to the following conclusions:

1. That serous detachment of the choroid and ciliary body is the natural accompaniment of considerable reduction of the intraocular pressure, and that its occurrence is the rule in every case of sustained reduction of pressure.

2. That the degree of the detachment varies, more or less directly, as the degree of reduction of the intraocular pressure.

3. That the fluid responsible for the detachment is derived probably from the choroidal blood vessels, and not improbably from the veins.

4. That reduction in intraocular pressure is the chief factor in the causation of detachment of the choroid and ciliary body in shrunken eyes; whereas an increased intraocular pressure may suffice to counteract, completely or in part, the tendency of a cyclitic membrane to produce such detachment by traction.

W. E. B.

**The Surgical Treatment of Corneal Ulcer and Its Complications,
With Special Reference to Operation for Anterior Synéchia.**

HUDSON, A. C. (*The Royal London Ophthalmic Hospital Reports*, Vol. XIX, Part II, January, 1914). In speaking first of the anatomy of corneal ulcers he draws attention to the fact that in the deepest layers of the cornea lying opposite to the area of ulceration, or separated from it by a layer of more or less clear corneal tissue, there may even be seen on oblique inspection an area of gray infiltration, and passing downwards from this a yellowish fan-shaped extension which appears to become continuous with the hypopyon in the anterior chamber. It is of prime importance for rational treatment to realize that this area of deep infiltration, like the hypopyon itself, is to be regarded as an evidence, not of the presence of microorganisms in this situation, but of a protective action on the part of the tissues, evoked by the stimulus of toxins developed in the infected tissues of the ulcer itself.

The presence within the anterior chamber of an aqueous humor not only abnormally rich in albuminous material, but containing in addition enormous numbers of cells having direct access to the spaces of the ligamentum pectinatum, is peculiarly liable to be associated with an increase of intraocular pressure; and there can be little doubt that this liability is accentuated by the action of mydriatics, whose use is, nevertheless, absolutely indicated in order to combat the serious complications which must otherwise supervene as the result of iritis. Such increase of pressure reacts unfavorably on the diseased cornea in two ways: first, by interfering with the lymph circulation and so with the nutrition of the tissues; and

secondly, by initiating an actual stretching of the area weakened by ulceration; and it is easy to imagine how these two factors may react on one another as components of a vicious circle. In view of these considerations, the extreme importance of the most careful observation of the intraocular tension, and of the adoption of suitable surgical measures in the event of a sustained increase, cannot be too strongly emphasized. In the selection of local applications choice lies between the use of strong antiseptics and the actual cautery. His own preference is for the use of carbolic acid as opposed to the actual cautery, on the ground that its action can be more accurately limited, while the resulting scar is less extensive and less dense. To combat intraocular pressure he prefers paracentesis of the anterior chamber at the limbus, the evacuation including, as far as possible, the cellular as well as the fluid contents of the chamber. When this procedure fails or perforation seems imminent, the "Saemisch section" should be resorted to.

Under the treatment of later complications he describes in detail his operation for severing anterior synechiæ, and lays special emphasis upon the important points of the operation, the details of which are given.

W. E. B.

ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

BY

ALBERT C. SAUTTER, M. D.,

PHILADELPHIA.

MAX W. JACOBS, M. D.,

ST. LOUIS.

J. W. CHARLES, M. D.,

ST. LOUIS.

Experimental Investigations Concerning Regeneration of the Corneal Epithelium.

LOEWENSTEIN (*Muench. med. Woch.*, 1913, No. 27; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, November 27, 1913) finds that the regeneration of the corneal epithelium occurs more slowly centrally than at the periphery. The vessels of the conjunctiva and muscles have no influence upon the nutrition of the superficial corneal layers. Circumscribed limbus cauterization may retard epithelial regeneration at this point. After section of all ciliary vessels regeneration does not begin until after the formation of new vessels from the conjunctiva, resembling an epaulette pannus. Partial section of the ciliary vessels causes a transient disturbance of nutrition in the affected region. Division of the trigeminus and elimination of the cervical sympathetic affects regeneration very slightly. Mild inflammatory irritation stimulates regeneration, while severe inflammation retards or completely checks regeneration. Persistent lowered tension increases the rapidity of regeneration.

A. C. S.

The Effect of Blood Injections Into the Vitreous, With Remarks on Retinitis Proliferans.

OGUCHI, Tokio, Heidelberg (*Gräfe's Archiv. f. Ophthalm.*, Vol. 84, Part 3; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, November 13, 1913), found that blood which he had injected into the vitreous of the rabbit became disintegrated and taken up by the migratory cells from the ciliary processes and the

connective tissue network of the papilla. These cells then return to the papilla and inner surface of the retina. A portion of the blood was taken up by the central canal.

Retinitis pigmentosa of the human corresponds in animal experimentation to destruction of the retinal layers with immigration of pigment epithelium induced by the hemoglobin in the injected blood.

He also claims that glial proliferation plays a subordinate part in the causation of genuine retinitis proliferans. This affection is always preceded by hemorrhage. The connective tissue new formation originates from the perivascular tissue of the papilla. This connective tissue proliferation is entirely dependent upon contact of the vitreous hemorrhage with the surface of the papilla. In retinitis proliferans of traumatic origin the connective tissue development from the site of perforation plays an important role. A. C. S.

Experimental Contributions Concerning the Origin of Choked Disc.

RADOS (*Berlin. klin. Woch.*, 1914, No. 2: Abst. in *Woch. f. Ther. u. Hyg. des Auges*, January 29, 1914), by injecting intracranially in white rats a sarcoma pap obtained from a Jensen subcutaneous sarcoma stock, was able to produce brain tumors which many times were associated with choked disc. A discussion of the histologic findings will be the subject of a further contribution. A. C. S.

Pathologic Anatomy of the Retina After the Extirpation of a Tumor of the Optic Nerve.

KOYONAGI (*Klin. Monatsbl. f. Augenhcil.*, May, 1913) publishes the results of examination of an eye enucleated one month after the posterior ciliary vessels had been cut in extirpating a tumor of the optic nerve. The retina was atrophic, the layers undifferentiated and the pigmentation marked. The choroid showed an absence of the choriocapillaries. Koyonagi believes that in his case the high grade atrophy and pigment infiltration was due, as Studer has claimed, to a section of all the posterior ciliary vessels, plus section of the anterior ciliaries. The excessive pigmentation of the retina and optic disc, the author thinks, was due to direct proliferation of the pigment epithelium. M. W. J.

**The Relationship Between Rheumatic Eye Diseases and
"Secondary" Tuberculosis.**

WIRTZ (*Klin. Monatsbl. f. Augenheilk.*, May, 1913) calls attention to the fact that the diagnostic test with tuberculin in rheumatic patients with eye trouble produces general reactions strikingly often. He examined a series of twenty-one persons, of whom six had episcleritis, fourteen iridocyclitis, and one sclerokeratitis. General examination disclosed the clinical picture of tuberculosis in nine cases, of which two showed episcleritis and seven iritis, so that twelve remained in whom no active general tuberculosis could be diagnosed. In eleven of the twelve, tubercle bacilli were demonstrable in the blood. The blood of the twelfth patient was not examined.

Wirtz uses the term "secondary" tuberculosis in the sense used by recent investigators, who describe a primary, secondary and tertiary stage of the disease. The primary represents the stage of infection, the secondary the interval from the first to the tertiary stage, which corresponds to the usual picture of tuberculosis. Wirtz gave his patients "antirheumatic" treatment, as his experience with tuberculin has not proven satisfactory. He subjected his patients to cabinet sweats, ten to twenty minutes at a time, this treatment being continued from six to eight weeks after the eye condition had become normal. He thinks, however, that at times a combination of this treatment with tuberculin may be an advantage. During the sweating, patients are not permitted to become overcome by faintness and are kept in bed. Those of means are sent to a warmer and drier climate during the winter.

M. W. J.

A Perithelioma of the Lid.

EICKE (*Klin. Monatsbl. f. Augenheilk.*, May, 1913). This was a growth which had been of two years' standing. There were no symptoms excepting the disfigurement. Microscopically it showed typical arrangement of cells about the small vessels. Parts of the tumor showed myxomatous changes.

M. W. J.

Concerning Rare Types of Tuberculosis of the Eye and Lids.

BOER (*Gräfe's Archiv. f. Ophthal.*, Vol. 85, Part 2; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, February 19, 1914) reports a case of tuberculosis of the tarsus, a case of con-

junctival tuberculosis, a case of tuberculous tumor formation of the bulbar conjunctiva, a case of nodular episcleritis, a case of tuberculosis of the ciliary body, and one of retinal tuberculosis. Test inoculations and demonstration of bacilli proved negative. Inasmuch as tuberculous foci in other parts of the body could not be found, he suggests the possibility of a tuberculous focus in a gland not demonstrable by clinical methods. In a number of tuberculous affections, for instance in conjunctival tuberculosis, an ectogenous infection seems probable. Operative treatment proved successful in the first four cases; in the last two enucleation had to be done. A. C. S.

Report on the Results of an Investigation Concerning the Frequent Association of Hemeralopia With Xerosis in the Spring of 1912.

HIPPEL (*Klin. Monatsbl. f. Augenheilk.*, May, 1913) investigated an epidemic of hemeralopia in Saxony and adjacent districts. One hundred cases were reported, of which practically all showed xerosis conjunctivæ. Of the eighty-two patients, sixty-eight were males. The individuals were poorly nourished, owing to poor crops in the immediate neighborhood and the high price of meat. All cases which could be followed recovered within a week under treatment which consisted in bandaging the eyes for three days and good nourishment—which was of course continued after removal of the bandage, when dark glasses were ordered. Dispensary patients received dark glasses, tr. chinæ or cod liver oil. That dazzling is a factor Hippel thinks proven by the beneficial results obtained by bandaging the eyes for a few days. The relationship between this condition and keratomalacia with xerosis could not be definitely ascertained, although one observer found xerosis conjunctivæ in two children of a family in which a still younger member had keratomalacia. Owing to the age of the children the presence of hemeralopia could not be ascertained.

M. W. J.

A Case of Trachoma Granules on the Bulbar Conjunctiva.

KURISAKA, Ashikaga, Japan (*Woch. f. Ther. u. Hyg. des Auges*, November 6, 1913), observed four miliary trachoma granules on the nasal bulbar conjunctiva in a case of tarsal trachomatous conjunctivitis.

A. C. S.

The Etiology of Idiopathic Hemeralopia and of Xerosis Conjunctivæ.

ISHIHARA (*Klin. Monatsbl. f. Augenheilk.*, May, 1913) found that cod liver oil acts brilliantly in cases of hemeralopia with xerotic changes. The oil derived from eel flesh acts equally well, but olive oil, although having a favorable influence, is much inferior. He believes that the hemeralopia or the closely associated xerosis conjunctivæ is due to a lack of fatty substances in the blood. In his opinion there is a relationship between the formation of the visual purple, kerato-hyalin and the fatty substances.

M. W. J.

Syphilitic Initial Lesion of the Conjunctiva of the Upper Lid.

FISCHER, THEODORE, Galati (*Zeitsch. f. Augh.*, XXX, October 4, 1913). At the end of January, 1909, the twenty-six-year-old patient came with conjunctivitis. There was marked congestion of the conjunctival vessels, with reddening of the upper fold at the outer canthus. Increased lacrimation; no photophobia, blepharitis or squamosa. On February 2nd the slightly edematous upper lid was everted, the patient looking strongly downward. Near the lacrimal gland there appeared a pin-head sized delicate gray-white surface from which was wiped a fibrinous deposit. The lid swelling then increased, the lid margin became of a light violet color, and the lid felt thicker on eversion. In the place of the small excoriation there now appeared an ulcer 3 to 4 mm. wide with indurated edges. The conjunctiva was chemotic and not movable over the sclera. The preauricular glands were swollen. Anti-syphilitic treatment resulted in recovery in three weeks. In three years the patient has suffered no other manifestation of the disease. New Year's eve the patient had been kissed on the eyelids by a strange woman. Soiled hands were not excluded as a contaminating cause.

J. W. C.

The Combination of Spring Catarrh With Trachoma.

BAYER (*Klin. Monatsbl. f. Augenheilk.*, May, 1913) reports a case in which neither clinically nor anatomically could spring catarrh be demonstrated. The absolutely unfavorable results by the usual methods of treating trachoma led to the finding of eosinophiles in the eye secretion and in the blood. The

Heissrath-Kuhnt excision of the tarsus gave a good result, although one eye, owing to earlier perforation, was beyond rescue.

M. W. J.

Obstetrical Injuries of the Eye.

KRAUSS (*Muench. med. Woch.*, 1913, 35; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, January 29, 1914) reports two cases of forceps delivery complicated with ocular traumatism. In one the usual linear corneal opacity resulted. In the other, luxation of the globe occurred during delivery. This luxation was reduced by the attending obstetrician, and a compress bandage applied. On removing the bandage the next day the luxation had recurred. The conjunctiva in the lower cul-de-sac was torn. Enucleation three days later because of purulent keratitis. Examination showed the optic nerve severed and all the external muscles torn across, excepting the superior rectus and the superior oblique.

A. C. S.

Lesions of the Cornea After Anesthesia.

SCHNAUDIGEL (*Muench. med. Woch.*, 1913, No. 29; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, January 29, 1914) cites two cases in which there occurred lesions of the central corneal epithelium, unquestionably the result of testing the sensibility of the cornea with the finger. He emphasizes the danger of coarse digital manipulation of the eye, especially of the central portions, and condemns this method of determining the degree of anesthesia. If necessary the extreme temporal portion of the bulbar conjunctiva may be touched, but in general the eye should be left alone.

A. C. S.

Concerning a Few of the Rarer Foreign Body Injuries of the Cornea.

SCHAEFLER (*Prager med. Woch.*, 1913, No. 31; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, January 22, 1914) reports four such cases.

Case 1.—Chestnut burr injury of the cornea, found to contain ten $\frac{1}{2}$ to $1\frac{1}{2}$ mm. long prickles, one of which had penetrated into the anterior chamber. Removal was attended with much difficulty.

Case 2.—Within a grayish white interstitial opacity of the cornea a one millimeter long black hair-like structure was discernible, which proved to be an insect sting.

Case 3.—At the extremity of a tongue-like opacity projecting from the limbus was found the wing sheath of a wood beetle.

Case 4.—In a five-week-old infant who was supposed to have an iris prolapse, there was found embedded in the cornea a fragment of a poppy seed.

Corneal foreign bodies contaminated with soil may give rise to a tetanus infection. In Prague two cases of actinomycosis infection of the cornea have been observed in coal breakers. A. C. S.

The Malignancy of Pigmented Tumors of the Eye.

HOOR (*Klin. Monatsbl. f. Augenheilk.*, May, 1913) reiterates that melanosarcomata can originate in pigmented moles of the limbus. He claims from observation of a case in a girl of fifteen years that degeneration of the mole can occur at an early age and metastases appear when the degeneration has scarcely begun, in fact when the latter can hardly be detected by histologic examination. His patient died in a short time after the removal of the growth and metastases. He advises early removal of such pigmented growths. M. W. J.

Blue Scleræ and Brittleness of Bones.

PETERS (*Klin. Monatsbl. f. Augenheilk.*, May, 1913) calls attention to the fact, already reported by others, that the bones of persons with blue scleræ are frequently very brittle. He found the combination in a family which came under his observation, and suggests that it would be well to excuse such persons from military service or gymnastic exercises. He considers the phenomenon as due to lack of or deficiency in fibrous tissue, and consequently amenable to no treatment but prophylaxis. M. W. J.

Peridacryocystitis.

ELSCHNIG (*Prager med. Woch.*, 1913, No. 38; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, January 15, 1914). Peridacryocystitis is only recognizable in its incipient stages; advanced cases appear as phlegmonous dacryocystitis. The writer observed this affection seven times in five years. In this affection irrigation is possible, and the sac contains no purulent secretion. As the disease progresses, however, an erosion of the sac wall occurs, and the peridacryocystitis becomes a phlegmonous dacryocystitis.

In the etiology acute and chronic suppurations of the nose and accessory sinuses play an important role. Of the seven cases, four showed sinus disease and three acute or chronic rhinitis.

In three cases of recent peridacryocystitis, immediate treatment of the associated nasal complication, combined with anti-septic irrigation of the duct, brought the disease to a standstill without damage to the lacrimal duct having occurred.

A. C. S.

Participation of the Canaliculi in Tuberculosis of the Tear Sac.

WITTICH (*Klin. Monatsbl. f. Augenh.*, May, 1913) found, on histologic examination of a tuberculous sac, the tuberculous process in the canaliculi, and advises removal of a large portion of these structures when removing a tuberculous tear sac.

M. W. J.

Nystagmus.

IGERSHEIMER (*Bericht der Muench. med. Woch.*, 1913, 36, meeting June 18, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, January 22, 1914) found nystagmus in nine cases of hereditary lues, six of which exhibited normal fundus findings and three a specific chorioretinitis.

The nystagmus was generally present since birth and frequently associated with oblique head position and head nodding. Gross visual impairment was never present, vision ranging in those old enough for the test, from 5/5 to 5/20. Light sense appeared unaffected. Antiluetic therapy, at least in very young children, proved efficacious.

He inclines to the belief that in children nystagmus without ophthalmoscopic abnormalities is suggestive of lues.

A. C. S.

Injuries of the Eye From Dazzling in Observations of Solar Eclipses.

WERDENBERG (*Zeitschr. f. Augenh.*, October, November, and December, 1913, Vol. XXX, 4, 5, 6) contributes an exhaustive résumé with statistical groupings of all of the cases reported before the eclipse of 1912, and compares the findings with those reported in that year. This material was worked over with respect to each symptom and compared with those observed in 1912. Beginning with an extensive and interesting astronomic and historic portion, he then tabulates 188

cases as follows: Basle, 29; Siegfried, 18; Mackay, 7; German and Swiss, 19; French, 25; foreigners, 90.

In spite of the fact that the Basle papers printed a warning in fat type against looking at the eclipse without protective glasses, on the ground that the light even from the small crescent was sufficient to cause destructive disturbances in the eye, there were twenty-nine cases in that city.

Of the twenty-two cases seen in the Basle clinic, fifteen were affected in one eye and seven in both eyes. Agreeing with the literature of the older authors, monocular injuries predominated, usually the right eye being affected. In those cases in which one eye had been amblyopic, the better eye was usually injured. The majority of the cases occurred when the sun was obscured only one-third or two-thirds, before or after the maximum eclipse, because the patients believed that the danger was less than if they looked at the wholly uncovered sun; but the intensity of the injury depends on the duration of the dazzling and on the protection of the eye.

Symptoms.—Diminution of vision and central scotoma, usually positive, appearing on the first or second day as a dark spot or light gray fog; in many cases showing irregular "flimmer," oscillating or rotating movements which often lasted a month. Central fixation disturbed for distance, often for near. Blendungsstörungen and pain, the latter one time described as pricking. Headache was occasionally present, also after-images of the sun, beginning immediately as light spots, sometimes with color phases, visible in the dark, followed by the central scotoma.

He refers to six cases of retinal hyperesthesia, photophobia, photopsia, ciliary pain, and conjunctivitis.

I. Vision.—Of one hundred and thirty-one cases out of the one hundred and eighty-eight reported there were observed—

Twenty-four with vision equaling one to three-fourths; two-thirds of these showed early tendency to recovery.

Forty-three with vision equaling two-thirds to one-half, of which the majority showed early tendency to recovery.

Sixty-seven with vision equaling two-fifths to one-two-hundredth; one-half showed early, one sixth showed slow, two-fifths showed no tendency to recovery.

In the Basle cases there was a remarkably rapid favorable course, in the majority of the severe cases lasting from two to

six weeks. In the medium grades of injuries, on the contrary, the period was six weeks to three months.

II. Scotoma.—“The scotoma was usually positive, absolute, central, of more or less distinct outline, black or dark gray to light gray: it was seldom negative or relative, and not very often paracentral. In a very small percentage a scotoma was absent.” “Average size, $1\frac{1}{2}^{\circ}$ to 1° . Basle group, $1\frac{1}{2}^{\circ}$ to $1\frac{1}{3}^{\circ}$.”

III. Peripheral visual field disturbances consisted of narrowing, usually for white and red. In the Basle group six cases exhibited a slight narrowing.

IV. After-images.—In the one hundred and eighty-eight cases reported, thirty-one showed after-images: sixteen as light spots, fifteen with color phases. Both light and color after-images commenced immediately and gave place usually on the second day to the gray scotoma.

V. Metamorphopsia is indicative of an inflammatory process of the choroid and retina, causing displacement of the retinal elements.

VI. Ophthalmoscopic appearances varied from: (1) absence through (2) slight—“enlargement, veiling, washed out, irregular, foveal reflex, with dark chocolate brown discoloration of the neighborhood—to (3) severe—a light yellow or white focus of round or irregular form. In a small proportion it took the sickle shape of the sun picture, “opto- or heliogram.” Sometimes there was only a stippling in the macular region. These foci usually disappeared in the first or second week and were replaced by a brown pigmented area. The final result in the Basle medium and severe cases was more or less pigmentation and usually slight enlargement of the irregular macula. Only once was there left a sickle-shaped scar like those mentioned by the other writers. J. W. C.

A Case of Embolism of a Branch of the Central Artery of the Retina.

v. PFLUGK, Dresden (*Woch. f. Ther. u. Hyg. des. Auges*, January 1, 1914), reports the case of a twenty-two-year-old woman, who consulted him because of impaired vision in her right eye, first noticed two days previously. Ophthalmoscopic examination revealed obliteration of one of the arterial branches with localized edema. Vision, 6/36. No evidence

of general vascular disease. Six days later she was admitted to the hospital and a paracentesis was performed, this operation being repeated twice during the succeeding four days. After the third operation vision had improved to 6/18, and within the next few weeks vision had returned to normal. The fundus also resumed its normal appearance. A. C. S.

Metastatic Ophthalmia.

ZADE (*Graefe's Archiv. f. Ophthalm.*, Vol. 85, Part 2; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, February 19, 1914) reports two cases. One case was associated with a streptococcic infection terminating fatally. Examination of both eyeballs, four hours after death, showed primary metastatic suppuration of the retinae, in one eye complete, in the other partial, with rupture of the retina. Streptococci present in the retinal capillaries, in the subretinal space and in the vitreous, but not found in the uvea or optic nerve. The second case complicated a meningitis resulting in a unilateral metastatic ophthalmia and finally phthisis bulbi. A coexisting heart lesion he attributed to the same infectious agent.

A. C. S.

Papillitis as an Early Symptom of Lues Congenita.

MOHR, MICH., AND BECK, S. CORNEL (*Zeitsch. f. Augenh.*, XXX, 6, December, 1913) examined one hundred and twenty-eight infants, finding papillitis in 62, doubtful in 19, healthy papillae in 47.

The relations to age were:

One week to three months, 86; papillitis in 49, or 58 per cent.

Four weeks to six months, 19; papillitis in 6, or 31 per cent.

Seven months to one and one-half years, 21; papillitis in 7, or 33 per cent.

The normal papilla of many suckling infants is gray, but sharply defined, without swelling and especially without exudate (Eversbusch). Ocular examination showed both pupils narrow, with prompt light reaction. Media transparent. Papilla swollen two, four or six diopters, with indistinct margins, gray or blue gray in color, continuing one-half a disc diameter into the retina. Many cases show a streaking of blood.

During recovery the exudate recedes, the swelling flattens,

the margin becomes distinct, and the papilla gradually assumes its normal pale rose color. The authors observed a transition into atrophy in a five-weeks-old child.

Papillitis thus becomes a very important factor in the diagnosis of syphilis, since it was often unaccompanied by other signs and confirmed only by a Wassermann reaction.

J. W. C.

A Case of Gumma of the Optic Papilla.

MYLIUS (*Klin. Monatsbl. f. Augenheilk.*, May, 1913) observed the condition in a female, aged twenty-five years. Vision had fallen to one-half and the mass measured 6 D. in height with the ophthalmoscope and completely obscured the disc. There was a clear history of lues and a positive Wassermann. Under treatment vision became normal, and when the patient was discharged the disc had the appearance of a neuroretinitis, the mass itself having disappeared.

M. W. J.

A Case of Myxosarcoma of the Optic Nerve.

SEGL, MOROO (*Klin. Monatsbl. f. Augenheilk.*, May, 1913), reports on an orbital tumor removed from a seven-year-old girl. Tumor was suspected because of the exophthalmos observed two years before enucleation. Review of the literature on tumors of the opticus follows.

M. W. J.

A Contribution to the Treatment of Infections After Cataract Operations.

KUHNT, H. (*Zeitschr. f. Augenh.*, October, 1913, XXX, 4), a number of times removed the infiltration from the wound margin, extracted the pupillary exudate and irrigated the anterior chamber with physiologic salt solution or the oxycyanate (1-10,000), and then covered the wound with a double conjunctival flap. Violent pneumococcic infections yielded to treatment after excision of the infiltrated part. In the last four years he successfully treated two cases by a daily opening of the wound, thereby allowing the aqueous to escape until the corneal infiltration and the discoloration had disappeared—in one case for thirteen days after the onset of infection, and again in the recurrence which appeared on the nineteenth day, he kept the anterior chamber open for fourteen days more.

J. W. C.

The Keratome in Cataract Extraction.

BEST (*Klin. Monatsbl. f. Augenheilk.*, May, 1913) objects to the conjunctival flap in cataract operations because the vascular system which nourishes the cornea is damaged, and says that the advantage is in favor of the smaller incision at the limbus. Corneal wounds, if not infected, become agglutinated very rapidly and heal at least as promptly as those of the conjunctiva. The incision with the Graefe knife, because of the counter puncture and consequent sawing movements through the cornea, does not give as smooth a cut as when made with a bent or bayonet-shaped keratome. He uses one which incises 75° of the limbus. The wound gapes less than when a Graefe knife is used, and the delivery of the lens requires more time, but the period of healing is shorter. M. W. J.

Extraction of Copper Splinters From the Vitreous Chamber.

VAN DER HOEVE (*Klin. Monatsbl. f. Augenheilk.*, May, 1913) thinks von Hippel's recent report of good results in copper splinter extraction merely evidence of an excellent technic, and does not believe that we should attempt such extraction unless an attempt at localization with the Roentgen ray has been made. M. W. J.

The Present Status of Glaucoma Therapy.

SATTLER, H. (*Berlin. klin. Woch.*, 1913, Nos. 49 and 50; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, January 8, 1914), after discussing the symptomatology and factors predisposing to increased tension in glaucoma simplex, takes up the treatment of glaucoma in general. He emphasizes the importance of constitutional treatment, regulation of diet (preferably lactovegetarian) and correct living habits. Baths at 35° C., two or three times a week, are of advantage. In cases complicated with marked arteriosclerosis, small doses of iodid for a long period of time, or sod. nitrate or nitroglycerin, are indicated. In cases with a blood pressure over 200, venesection proves beneficial.

In the local treatment, miotics hold an important position, but generally are unable to replace operative interference.

A patient with acute glaucoma should be put to bed, the pain controlled with morphin or aspirin, and eserine or pilocarpin, or, better still, v. Arlt's mixture of pilocarpin and dionin, in-

stilled into the conjunctival sac. In case the anterior chamber remains shallow and the pupil dilated, a posterior sclerotomy may precede the iridectomy. Of late, however, he has been doing Elliot's operation in these cases.

Miotics are extremely valuable in the prodromal stage of chronic glaucoma, but the patients must be kept under strict observation. When the tension exceeds 26 to 30 mm. Hg., operation is indicated.

Excepting in one case he had good success with Lagrange's operation. Since 1911 he has relied exclusively on Elliot's method in primary and selected cases of secondary glaucoma. In infantile glaucoma he considers this operation superior to all others. He believes Elliot's operation belongs to the future, and that it will eventually replace all other glaucoma operations, and probably even iridectomy itself, at least in the chronic forms of glaucoma.

A. C. S.

Treatment of Trachoma.

KUHNT, H. (*Zeitsch. f. Augenh.*, December, 1913, XXX, 6), emphasizing the importance of studying the individual and his environment as well as the stage and the form of the disease, advocates rigid cleanliness, separate wash basins and towels, the avoidance of touching the eye with soiled hands, and all rubbing and wiping of the lids. He also believes in the virtues of pure and dust-free air.

1. Fresh granulations in immune or dry regions indicate medication with silver nitrate (or lead acetate), later copper salts.

2. If the process advances in spite of these, the galvano-cautery is recommended for the separate granules, followed by brushing, rubbing away, or massage. Also light therapy may be attempted.

3. In the follicular stage, expression is recommended, followed by medication; the expression may be repeated.

(Kuhnt's expression plate forceps causes very little injury, the conjunctival plate being pierced by a number of holes 1.25 mm. in diameter and 0.75 to 0.9 mm. apart.)

If no results follow, or corneal complications threaten, he loses no time in excising the fold (simple or combined).

The cicatricial stage contraindicates any removal of the conjunctiva. He excises the tarsus; this is the best means of avoiding or relieving already existing pannus.

J. W. C.

Treatment of Dacryocystitis, Especially the Chronic Forms.

KUHNT, H. (*Zeitschr. f. Augenh.*, November, 1913, XXX, 5), maintains that diseases of the lacrimal drainage apparatus are, without exception, secondary to: 1. General disease. 2. Conjunctival disease. 3. Nasal disease. 4. Disease of the neighboring tissues, especially of the periosteum and of the bone in the region of the lacrimal fossa and tear duct.

1. General Disease.—Lues and tuberculosis and many acute and chronic infections—clinically, a chronic, sometimes phlegmonous, dacryocystitis.

2. Conjunctival disease.—These are rather exceptional (blepharorrhea, diphtheria, croup).

3. Nasal causes are of the greatest significance. Recurrent coryzas, by a continuation of the process through the nasal duct; the faulty position of the septum and concha inferior, and also the affections of the anterior nasal sinuses.

In sixty-three cases handled in his clinic, 63.5 per cent were associated with undoubted sinus affections; 22.2 per cent were associated with well-founded suspicion of sinus affection; 11.3 per cent were associated with intranasal disease; 3 per cent were associated with normal nasal findings.

He attempts, first, syringing after dilating the punctum (never into the sac). If this is unsuccessful, careful probing with the probe-pointed whalebone sound follows. Seeking to avoid injury to the mucous membrane, he does not advocate the use of either stiff or large probes. If these methods are of no avail, he concludes with the following indications for extirpation of the sac:

1. Tuberculous and lupoid dacryocystitis, also ozenas.
2. Highgrade (polypus, etc.) mucous membrane changes.
3. Very shrunk sac, e. g., in old trachoma.
4. All cases of extensive and deep bone affections.
5. Nonpostponable operations on the globe.

6. Window resections of the duct in the anterior court of the middle nasal passage (Polyak), in tight strictures or bony closures at the nasal aperture, if the canaliculi, sac and canal are free from changes.

7. Opening of the sac and canal from the antrum in antritis.

8. The extranasal dacryocystorhinostomy according to Toti, especially applicable in the ectatic forms, if at least one canaliculus and punctum are normal.

J. W. C.

Calcium Therapy in Some Eye Diseases.

DUTOIT, A. (*Zeitschr. f. Augenh.*, November, 1913, XXX, 5). Kalmopyrin is an organic compound of calcium which combines the "antipyretic, antirheumatic and analgesic effect of acetylsalicylic acid with the tonic, the antispasmodic and the cardiac contraction, amplitude increasing effect of calcium with its quality of increasing the coagulability of the blood." It contains 9.23 per cent Ca, is easily soluble in water, shows only a very slight instability, and injures neither the stomach nor the kidneys. It is not changed in the stomach, but in the presence of the alkaline juices of the intestine splits up into calcium and acetylsalicylic acid. The dose of the powder is 0.1 to 0.5 gr.

He believes that his treatment has been more effective in "scrofulous" patients suffering with conjunctivitis, blepharitis with eczema of the skin, and phlyctenular disease. In cases of glaucoma combined with arteriosclerosis, he saw favorable results from the use of "Ringer's serum."

Chronic conjunctivitis which was not scrofulous, iritides, and iridocyclitides with marked exudation, seemed to yield to calcium lactate, often to "Ringer's serum," with surprising readiness.

J. W. C.

Noviform Therapy in Ophthalmia Neonatorum.

WOLFFBERG, Breslau (*Woch. f. Ther. u. Hyg. des Auges*, February 19, 1914), reports three cases of ophthalmia neonatorum in which he used noviform ointment with marked success. After cleansing the eyes with an oxyanid of mercury solution, 10 per cent noviform ointment was introduced into the cul-de-sac. This was repeated every four hours. This was the treatment followed in one case. In the other two cases the treatment was the same, except that a silver derivative was instilled prior to the introduction of the ointment. The combined noviform-silver treatment he considers perhaps the preferable procedure.

A. C. S.

Treatment of Ophthalmia Neonatorum With Noviform.

HAASS, Viersen (*Woch. f. Ther. u. Hyg. des Auges*, December 4, 1913), reports excellent results obtained in three cases of ophthalmia neonatorum treated with noviform ointment.

A. C. S.

Collodion, Pelote and Celluloid Film Treatment in Various Forms of Entropion.

KAZ, St. Petersburg (*Woch. f. Ther. u. Hyg. des Auges*, November 27, 1913). In the milder forms of senile entropion Kaz has had marked success with collodion applied to the everted lower lid, treatment being repeated daily if necessary. In cases in which entropion nevertheless persists and operation is refused, he orders the wearing of spectacles from the lower rims of which little pegs project to keep the lid from turning in (Pelote spectacles). In a case of trachomatous trichiasis and entropion of the upper lid, a celluloid film inserted beneath the lid and allowed to project slightly beyond the margin caused immediate improvement of the objective and subjective symptoms.

A. C. S.

The Influence of Diphtheria Curative Serum on Infectious Eye Diseases.

JANSON (*Klin. Monatsbl. f. Augenheilk.*, May, 1913) does not agree with Darier, that diphtheria serum is of value in the treatment of suppurating conditions of the cornea. It is very questionable whether it has any value, even as an adjuvant, during the administration of the usual remedies. M. W. J.

Electric Method of Treating Inflammatory Affections of the Eye.

v. REUSS (*Wicner med. Woch.*, 1913, No. 39; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, November 13, 1913) finds faradism a valuable aid in the treatment of iritis, iridocyclitis, purulent and nonpurulent keratitis, eczematous conjunctivitis, pseudoscleritis, blind painful eyes, and of ocular pain without objective findings. Half hour treatments are given, the current being gradually increased until the patient complains of discomfort. This form of treatment alleviates pain, shortens the disease process and stimulates the absorption of inflammatory exudates. (Vitreous opacities, precipitates.)

For obstinate ulcers of the cornea and fascicular keratitis, electrolysis has much to recommend it.

A. C. S.

A Five-time Recurring Papilloma of the Conjunctiva and Cornea Cured by Exposure to Mesothorium.

AGRICOLA (*Klin. Monatsbl. f. Augenheilk.*, May, 1913) raises the question whether papillomata really are benign, in view of the fact that they are prone to recur frequently. One of his patients had such recurrences frequently, but was

eventually cured by means of the following treatment with mesothorium: Five mgr. of mesothorium containing 40 per cent radium bromid was isolated in a hard rubber capsule having a 1 mm. window of mica. This 5 mgr. contained 2,000,000 units, corresponding to the activity of 1 mgr. of radium bromid. The treatment consisted of five-minute exposures three times a day. After six days there was a pause of eight days, then eight days of two applications daily of ten minutes each. After another break of three days the exposures were again given twice daily for six days, for fifteen minutes each. Immediately after the first six days the growth seemed larger. After the second course of eight days, it was possibly a little flatter. Within fourteen days after the last treatment the growth had disappeared, and ten months later had not recurred.

M. W. J.

Test Charts and Visual Acuity.

DOR (*Lyon med.*, 1913, No. 26; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, November 6, 1913) suggests constructing test letters on a millimeter basis. This would necessitate changing the reading distance to 3.55 m. or 7.10 m. One millimeter letters would represent a visual acuity of one, one centimeter letters a visual acuity of ten, etc.

A. C. S.

A Nonreflecting Ophthalmoscope.

BAUM (*Klin. Monatsbl. f. Augenheilk.*, May, 1913) claims the following advantages for his instrument:

1. The source of light is brought closer to the eye about to be examined.

2. None of the rays of light, owing to their parallelism, are wasted.

3. Owing to the greater proximity of the examining eye, one can see farther into the periphery.

4. Owing to simpler construction, it is cheaper than other electric ophthalmoscopes.

5. The picture is a direct one and not a reflected one.

M. W. J.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

BY

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SAN FRANCISCO,

AND

JESSE S. WYLER, M. D.,

CINCINNATI.

Preliminary Iridectomy Upwards and Combined Iridectomy Downwards in Adherent Cataracts Due to Chronic Uveitis.

TRUC, H., Montpellier (De la biiridectomie ou iridectomie double, supérieure préparatoire puis inférieure combinée dans les cataractes adhérentes de l'uvéite chronique, *Revue Gen. d'Ophthalmologie*, Vol. XXXII, p. 529, December, 1913), recalls the well-known fact that extraction of the lens in the cataracts due to chronic uveitis brings no amelioration of vision, as the uveal inflammation gives rise, as a rule, to a new occlusion of the pupil. In a number of such cases Truc has gotten good results from two iridectomies. The preparatory iridectomy is done upwards, several months before the extraction; the second is done downwards, combined with the extraction of the lens. Both iridectomies are very broad and carried well into the periphery. The result is a large, median, hourglass-shaped pupil, with small lateral fragments of the iris, and the danger from occlusion is very small. This procedure is applicable to other forms of adherent cataracts, as well as to the thick secondary cataracts with occlusion.

M. W. F.

Chronic Iridochoroiditis and Salvarsan.

BRANDÈS (Irido-choroidite et salvarsan, *Ann. de la Société medico-chirurgicale d'Anvers*, Vol. XVI, p. 189) injected 0.4 of salvarsan, and ordered injections, for a syphilitic patient with chronic iridochoroiditis, in whom the vision had sunk

to the barest perception of light, the fundus being invisible. Three days later the patient could see fingers at one meter. Seven days later he received another injection of salvarsan, and four days later the discs could be seen, both being very pale. Three days later the vision had risen to 2/24 in one eye and 3/18 in the other.

M. W. F.

The Treatment of Tobacco Amblyopia With Lecithin.

DE WAELE, Ghent (Sur la médication de l'amblyopie nicotinique par la lécithine, *Arch. d'Ophthalmologie*, Vol. XXXII, June, 1912, p. 356), bases his treatment on the theory that the lecithins, and not water, act as solvents of the alkaloids, and carry them to the nerve cells, where the lipoids, in which the nerve cells are very rich, hold them fast. In the same way, by increasing the amount of lipoids in the blood, the des-intoxication of the nervous system is effected, as confirmed by experience. Danis tried the method in four cases in the service of Gallemaerts; one chronic case gave an immediate good result; another case of a year's standing was not bettered; the third case showed considerable improvement after five injections, and the fourth case was very satisfactory. In five cases of de Waele the results were very encouraging. One must not forget that the withdrawal of tobacco alone will often effect a cure in recent cases. In old cases a limit of progress was reached, corresponding, no doubt, to the amount of permanent nerve lesion, but even in these cases the results showed the benefit of persevering. De Waele does not attribute much value to the routine exhibition of strychnin. Clin's oil preparation is injected every other day intramuscularly, although the subcutaneous method may also be employed. The intramuscular injections cause a strong local reaction after several injections have been given, so that a pause of ten to fifteen days has to be made, and the reaction is less intense when the injections are resumed. Merck's suspension in physiologic liquid are better borne, even in doses of 0.5.

M. W. F.

ABSTRACTS FROM SPANISH OPHTHALMIC LITERATURE.

BY

WILLIAM H. CRISP, M. D., OPH. D. (COLO.),

DENVER.

Congenital Asynergia of the Palpebral Movements.

GONZALEZ, JOSE DE JESUS, Leon, Mexico (*Anales de Oftalmologia*, December, 1913). The patient was a woman of twenty years, otherwise entirely normal and healthy, and the anomalous movements had occurred since birth. In direct forward gaze there was slight ptosis of the right upper lid, the difference between the palpebral apertures being 2 mm. When the patient looked up, the difference between the two sides increased to 4 mm. Blepharoptosis has been present on the anomalous side in most of the cases reported by other authors.

In direct downward vision the right upper lid was raised, while the left upper lid followed the eye downward in the normal way. The phenomenon occurred with equal intensity in looking down and to the left, but in greater degree in looking down and to the right, and was markedly accentuated if the patient laughed. But laughing had no effect when she looked directly forward, and the phenomenon was not influenced by opening of the mouth or by movements of the lower jaw. The abnormal elevation of the right upper lid could not be produced voluntarily, although by an effort of the will she was able to diminish the extent of the elevation.

The condition is to be regarded as a physiologic anomaly arising from an anatomic anomaly, which must consist of abnormal internuclear connections in the brain centers.

Four Cases of Corneoscleral Dermoid Tumor.

SANTOS FERNANDEZ, JUAN, Havana (*Anales de Oftalmologia*, September, 1913). In all four cases the tumor was astride the limbus. The average size was that of a small pea. In three out of the four the basis of attachment was on the cornea, in the fourth almost entirely on the sclera. In three the tumor occurred at the lower temporal quadrant, in the fourth almost directly downward. Only one of the tumors was microscopically examined, its component parts being skin, fibrous connective tissue, a few hair follicles, and some small zones of round cell infiltration. All four growths were of almost cartilaginous consistency.

Application of 606 and 914 in Ocular Affections.

ARBOLEDA, ARTURO, Bogota, Colombia (*Anales de Oftalmologia*, October, 1913). A case of syphilitic optic neuritis which grew worse after an injection of 0.35 g. of 606 was further treated on the principle that such disturbances are due to the spirochetal toxins liberated by the drug, and an injection of 0.45 g. of 606 was given with excellent results. In a second case, paralysis of the left fifth nerve developed a few days after the first dose of salvarsan, and disappeared after a further dose.

Prophylactic Antisepsis in Eye Operations.

ALONSO, ANTONIO, Mexico City (*Anales de Oftalmologia*, November, 1913). In a number of cases of cataract extraction very satisfactory results as regards absence of infection were obtained after the use, at the end of the operation, of a 5 to 10 per cent solution of collargol, which was placed in contact with the wound and the whole conjunctival sac.

Ossification of the Eyeball, Especially of the Choroid.

GUARNIDO, ADELARDO MORA, Madrid (*Archivos de Oftalmologia*, September, 1913). Three cases are reported. In the first the eye was enucleated eleven months after severe but nonpenetrating traumatism which had been followed by violent iridocyclitis. The ossified choroidal tissue took the form of a truncated quadrangular pyramid, with its upper face greater than the others, its base excavated, and an opening

at the apex corresponding to the optic nerve entrance. It consisted of completely organized bony tissue. In the second case the eye of a patient of fifty-one years was enucleated seven months after an unsuccessful attempt at cataract extraction in which part of the lens was left behind, and which was followed by inflammation lasting over three months. The ossification involved almost the whole of the choroid and ciliary processes. The lens remnant was also calcified. The bony sphere was made up of superimposed and concentric laminae. There was a doubtful history of syphilis. In the third case the antecedent inflammation had occurred fifteen years before, and had consisted of corneal ulcer followed by perforation, with incarceration of the iris. There were a number of ossified areas in the choroid. The report of cases is followed by an ample review of the subject.

Salvarsan and Ocular Syphilis.

LEOZ ORTIN, GALO, Madrid (*Archivos de Oftalmologia*, September, 1913). After expressing his firm opinion that salvarsan has not supplanted mercury in the treatment of syphilis, the author reports four cases as illustrating the extreme usefulness of salvarsan in producing a rapid subsidence of syphilitic disturbances in the eye. In three cases of plastic iritis very slight initial improvement, with subsequent increase of severity, had followed injections of gray oil and of benzoate of mercury. Within forty-eight hours after respective doses of 6, 5, and 4 dg. of salvarsan intravenously, there was marked improvement, and within three days atropin produced ample dilatation of the pupil. The fourth case was one of gumma of the ciliary body accompanying florid general syphilis. The gumma increased considerably in size during a week of daily injections of biniodid of mercury, combined with enesol. After intravenous injection of 6 dg. of salvarsan there was astonishingly rapid improvement of all the general symptoms, with simultaneous reduction in the size of the ocular gumma.

Adequate Use of Diagnostic Measures.

MENACHO, MANUEL, Barcelona (*Archivos de Oftalmologia*, September, 1913). Examination of the visual fields showed that a case of visual disturbance in which there were no other symptoms except a cupping of the disc of doubtful character,

but which had been diagnosed as glaucomatous, was one of complete left homonymous hemianopsia without distinct symptoms of glaucoma.

Astigmatism.

RIBAS VALERO, Seville (*Archivos de Oftalmologia*, October, 1913). This is a general review, over sixty pages long, of the geometric optics of astigmatism. In its concluding pages the author belabors the subjects of "biastigmatism" and "bioblique astigmatism." American readers are hardly likely to be interested in his impractical conclusions.

ABSTRACTS FROM SCANDINAVIAN OPHTHALMIC LITERATURE.

BY

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DENVER.

Anatomic Study of the Operative Star and Optic Disc After Successful Glaucoma Operations.

HOLTH, S., Christiania (*Norsk Magazin for Lægevidenskaben*, December, 1913). An account is given of the microscopic findings in four eyes removed postmortem from two glaucoma patients, upon whose eyes operations for producing a fistula at the limbus had been done one-half, three, and four and one-half years previously. Both eyes of the first patient were subjected to Holth's iridencleisis operation. In the second patient the right eye underwent limbal sclerectomy with Holth's trephine forceps, and the left eye, sclerectomy with the same instrument, combined with iridectomy. Since 1908 Holth has done subconjunctival sclerectomy at the corneoscleral limbus according to Lagrange's principle, either with trephine forceps or by Elliot's method. The best results were obtained when the site of sclerectomy showed a persistent dark opening in the sclera, covered and surrounded by edematous conjunctiva. The writer interprets his present anatomic studies as indicating that the cause of nonclosure of the scleral defect with scar tissue, in the permanently successful cases, is to be found in lining of the walls of the defect with uveal pigment epithelium. He finds that the necessary persistent contact of the iris with the wound is not so readily obtained by Elliot's method as when trephine forceps are used after opening the anterior chamber with a narrow knife or a lance; and he further prefers his own technic to Elliot's, as offering less risk of injury to the ciliary body, and hence greater security against the occurrence of the slow iridocyclitis which, in common with other workers, he has sometimes encountered after doing Elliot's operation.

The four eyes now described, in all of which the tension had become and remained normal or slightly subnormal, showed a retrogression of the papillary excavation which had previously existed. In three of the eyes the lamina cribrosa had come forward to its normal position, while in the fourth eye, a case of very advanced glaucoma, the connective tissue surrounding the central vessels had left the lamina and come forward to the level of the retina.

Further Experiences With Preequatorial Sclerectomy in Retinal Detachment and High Myopia.

HOLTH, S., Christiania (*Norsk Magazin for Laegevidenskaben*, February, 1914). In a series of five cases in which this operation was done for high myopia, the results seemed to indicate that the operation only produces a reduction in the refraction in cases which have shown pronounced posterior staphyloma. In a case in which there was no sign of conus or posterior staphyloma, the refraction remained unaltered four months after operation. Of seven cases in which the operation was done for retinal detachment, four, in which there had been tears in the detached retina, showed only transitory improvement after operation. Two cases in which no rent could be discovered showed complete recovery from the detachment. Reports as to the results of eleven cases more recently operated upon are reserved, for the reason that the author's earlier experience has shown that incomplete improvement during the first months may later be followed by complete recovery; whereas a complete cure in the course of the first few weeks may later give place to a repetition of the detachment. Some further cases operated upon by Schiötz, and which are briefly included in Holth's report, confirm the conclusion that if there are retinal tears, a marked improvement from sclerectomy is hardly to be hoped for. The tears must be looked for carefully under mydriasis, and may of course be overlooked on account of being concealed in the folds of the detached retina. If no tears can be found the operation is distinctly indicated. The operation is also decidedly called for in cases of high myopia in which there are symptoms of impending retinal detachment, such as photopsias, and very pronounced muscae volitantes (especially if associated with fresh vitreous opacities).

SOCIETY PROCEEDINGS.

BY

ARTHUR J. BEDELL, M. D.,

ALBANY.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

Regular Meeting, December 15, 1913. President Dr. Willis O. Nance in the chair.

Two Cases of Interstitial Keratitis:

Dr. C. G. Darling presented a man, forty-three years of age, who, when first seen by Dr. Reeder at the Rush dispensary, complained of lacrimation of the left eye. A very faint haze was to be seen in the lower temporal quadrant of the cornea, no vessels, other media clear, fundus normal. Three days later eye was more sensitive, with ciliary injection, interstitial haze more marked and extending toward the center of the cornea. A history of an initial lesion three years ago was obtained, the patient saying he had a slight alopecia and sores in the mouth. Wassermann, made by Dr. McClellan, was strongly positive. Today, ten days after seeing the patient, nodule has appeared in the iris. No sign of hereditary syphilis makes it very probable that this is a case of interstitial keratitis in acquired syphilis.

The other patient, also seen at the Rush Medical Eye Clinic, is a man, twenty-nine years old, who denies venereal disease; has two children living and well; his wife has had no miscarriages. He has a much more marked keratitis than the other patient, the whole cornea being hazy; new vessels growing in from limbus, marked ciliary injection. The case has

now been of one month's duration. No signs of hereditary syphilis and no family history of same. Wassermann, made by Dr. McClellan, strongly positive. Taking the history and age of patient into consideration, one might believe this to be a case of keratitis in acquired syphilis, although of course it may be a case of late interstitial in inherited syphilis.

Gouty Iritis.

Dr. A. C. Croftan referred to the rarity of typical gout in this country, the frequency in England, and the difficulty in making a prognosis of gouty iritis. He explained the sort of patients in whom a gouty condition might be suspected, describing the cases of frank gout with arthritic symptoms, tophi in the ears, etc., and those in whom the symptoms were more vague, who were perhaps regarded as neurasthenic, who had gastrointestinal disorders, possibly migraine, or asthmatic attacks. In such cases, if a violent iritis developed, there was nothing particular to point to gout, unless they were studied more from a chemical than a clinical point of view. He explained the manner of estimating the endogenous and the exogenous uric acid excretion in the urine on a general diet and on a purin-free diet. A purin-free diet might include eggs, milk, fish, etc.

Dr. Croftan expected to demonstrate a patient who had been brought before the society a year ago, who had a most violent iritis which resulted in the loss of one eye, in spite of the most energetic antirheumatic and tuberculin treatment. A year later he came back with the same condition in the other eye. After a study of his metabolism he was put on a purin-free diet for two or three days, given enormous doses of atophan, and within forty-eight hours the eye cleared up and has stayed clear, while during the previous year he had had a number of recurrences.

The other two cases presented some interesting features. The one was a woman, a patient of Dr. Casey Wood, who was in doubt about the etiology, and an equally good man differed with him as to whether it was tuberculous or rheumatic. She recovered on the antigouty treatment and remained well.

He recalled the similarity between real gout and the so-called lead gout. This was the case in a tin worker who had arthritis, migraine, asthma, eczema, and iritis. His purin meta-

bolism was worked out and the result has been very good under treatment.

The results in the three cases were such as to warrant the diagnosis of gouty iritis. In the treatment the diet should be purin-free, with the most rapid possible elimination, perhaps by some alkalies and atophan. He wished to hear of the experience of the members with cases of iritis which seemed to be gouty, and whether they could describe any features by which these cases could be distinguished from the tuberculous the rheumatic or the syphilitic.

Discussion.—Dr. H. W. Woodruff, Joliet, reported the case of one of his patients who had had twelve attacks of iritis in fourteen years, although he had good care, had been thoroughly examined, had been in the hospital for considerable periods and had been pronounced otherwise physically sound, both syphilis and tuberculosis reactions were negative. The attacks came on at certain definite times in the spring and fall, of late exceedingly severe so that the anterior chamber would become entirely filled with bloody exudate. Under local and eliminative treatment he had always made a thorough recovery until the last time, when the inflammation extended to the ciliary body, which left some exudate in the vitreous. The question of uric acid was not taken up in his examinations, but gout was eliminated in the history.

Dr. Woodruff asked Dr. Croftan to say something about the significance of indican in the urine.

Dr. W. H. Peck asked Dr. Croftan what form of alkalies he used.

Dr. J. C. Swan asked whether he considered eliminate treatment of any value in those cases.

Dr. M. Z. Albro, Chicago, reported the case of a man, forty-five years old, who had a severe iritis without hemorrhage or exudate. No history of rheumatism, and the Wassermann was negative. Effervescent lithia tablets with the ordinary local treatment cured the iritis.

Dr. W. A. Mann, Chicago, had seen a number of rheumatic cases, but so far as he knew no gouty cases. During the last two or three years, in addition to local treatment, he had used vaccines, with the idea that there might be infection. It was conceivable that the uric acid produced lessened resistance with increased liability to infection. Stephen Mayou of London had examined the aqueous in a number of these cases and

had recovered a few colonies of staphylococci in what he called rheumatic iritis.

Dr. W. O. Nance said he had eight or ten years ago reported to the society the case of a man of twenty-five years, who had had seven attacks of iritis. There was no syphilitic or rheumatic history. The etiology was never determined, and it is possible that it was due to the condition which Dr. Croftan has described.

Dr. Carroll B. Nelton, Peoria, asked what had been the result of the Wassermann test in Dr. Croftan's cases.

Dr. Croftan, in closing, said he gave alkalies, but did not think they did any particular good. Bicarbonate of soda or the alkaline waters probably exercise a good effect on the intestinal digestion. The cases are very commonly associated with hyperacidity, with a relatively low alkalinity in the intestinal digestion, rendering the flow of bile more difficult with toxemia from that cause. He is in the habit of using large colonic flushings with sodium bicarbonate. They help to keep the bowel clean and the solutions act as a mechanical distending factor on the region from which the bile comes, and then absorption of a certain amount of alkali aids. He has no faith in lithia and has never seen the slightest result from it. He thought vaccines were worth trying. The Wassermann test had always been made, but he was not as happy about it as formerly, especially a negative. Indican and the whole group of aromatic sulphates were important to study.

The Illinois School for the Blind and Its Statistics of Blindness.

Dr. Albyn Lincoln Adams, Jacksonville, gave a history of efforts to establish schools for the education of the blind in the United States, and described the Illinois institution, its origin through the efforts of Samuel Bacon, who was blind, and through his influence in the legislature the institution was started. Dr. Adams described the course of instruction for the blind as it has been developed, the methods of printing and writing, and the various industrial activities to make the blind self-supporting, all illustrated by lantern pictures.

Tables were shown of the number of blind taught in the institution since its founding, the percentages of blindness of different degrees in the inmates, and a classification of causes, following the scheme of Magnus. It was shown that seventeen per cent were due to ophthalmia neonatorum, fifteen per

cent to traumatism, twelve per cent to general diseases, and the remainder to other general causes which he classified as idiopathic. About thirty-five per cent was preventable blindness, ophthalmia neonatorum and traumatism in industrial pursuits being the causes.

Discussion.—In answer to questions, Dr. Adams said that in the last one hundred and forty-nine pupils, twenty-five were blind from ophthalmia neonatorum. The reason that the percentage was smaller than the average was because there were among them a large number of men. In Massachusetts they are accomplishing a great deal in the reduction of the number of cases, and he thought a large proportion of the blindness could be prevented by having proper legislation enforced.

Dr. Nance, in answer to a question, said an ordinance was passed in Chicago requiring the reporting of ophthalmia neonatorum. One year only thirty cases were reported. The present health commissioner, with a larger appropriation, expects to enforce the ordinance. Dr. Nance said that although many of these cases were blamed on the midwives, yet he had seen a statement to the effect that the physician is to blame in many cases.

Dr. Tivnen said that many hospitals would not take these cases unless they paid for a private room and had a special nurse, and that the Chicago Eye and Ear Infirmary and the Cook County Hospital were the only places that would take them without payment.

Dr. Gorge F. Suker said that Cook county had a separate hospital to take care of such cases without expense to the patients and with specially trained nurses. He thought it ought to be made compulsory to take patients there, whether charity patients or not. He thought it extremely reprehensible that any of these cases should occur, as they did, among a certain class of practitioners, and that there was no excuse for having one of these cases so badly treated as to permit of vision below the economic requirements. It could be cured.

Dr. Adams thought some of the expense of caring for the blind in institutions might be better spent in preventing this blindness.

Dr. Nance discussed the proper place for the treatment of ophthalmia neonatorum. The Cook County Hospital and the Eye and Ear Infirmary were able to care for them.

Ophthalmia Neonatorum With Report of a Typical Case.

Dr. C. F. Burkhardt, Effingham, stated that the medium of contagion in ophthalmia neonatorum, the discharge from the vagina of the mother, was pointed out by Piringer in 1839, and that its true etiology was known only after the discovery of Neisser and the demonstration of the role of contact by F. Jaeger. He gave a brief account of the characteristics of the disease and outlined his method of treatment, which consisted in placing the patient in a hospital, if possible, under a competent oculist and nurse, the application of cold to the eye, cleansing it with boric acid or other solutions at frequent intervals, and the instillation of argyrol, which he had found better than other silver salts. Nitrate of silver in two per cent solution might be used on the everted lids once a day. This was the plan of treatment followed in his case, which he first saw on the eleventh day after birth. Perfect recovery resulted. He dwelt on the importance of prophylaxis by the Crede method and on the responsibility of the profession in this regard. The cardinal point in the treatment he regarded as the frequent and thorough cleansing of the eye of all pus, thereby lessening the danger of corneal ulcer.

Discussion.—Dr. George F. Suker emphasized the importance of the proper technic of the Crede prophylaxis, and said it consisted in the instillation of a two per cent silver nitrate solution into the inner canthus of each eye while the head is passing over the perineum, and not after the child has been born.

Dr. Richard J. Tivnen said that the point emphasized by Dr. Burkhardt, of frequent and thorough cleansing, was the crux of the whole matter. In carrying this out a frequent mistake was in having the douche bag too high, which endangered the cornea. He recalled one case in which the cornea was abraded in this manner. He said that cultures should be made of every discharge in order to be on the safe side. He protested against the loose manner in which the Crede method was described in the textbooks, which allowed the inference that the instillations of the two per cent silver solution might be repeated, whereas subsequent use of the solution should be on the everted lids, and it should not come in contact with the cornea.

Dr. W. H. Peck said that practically all the blindness that occurs among nurses has come from their treating ophthalmia neonatorum and gonorrheal ophthalmia in the adult. In his lectures to the nurses he lays great stress on exercising care not to contract the disease. He favored nitrate of silver in treatment, and also argyrol in some cases, but in stronger solutions than those usually used. He also makes applications of iced pledgets of gauze, which limit swelling.

Dr. Clark W. Hawley said that in five years' service in the Cook County Hospital he had not lost a single eye from corneal ulcer, although his colleagues lost a number. The treatment he used was a solution of sixty to seventy grains of nitrate of silver to the ounce. For twenty-five years it has been favorable.

Dr. W. A. Mann mentioned the application of sterile vaselin to the lids to prevent them gluing together. Silver nitrate in five per cent solution had been his sheet-anchor, particularly in the late stages. Argyrol had also been used in fifty per cent solution. He knew of the loss of one eye by dropping in a five per cent solution of silver nitrate.

Dr. W. O. Nance said that the three essentials in the treatment were copious irrigations, the use of silver nitrate, and the maintenance of the physical condition of the patient. It had not been his experience to lose no eyes. He had seen them go from bad to worse under the best of care and treatment, even when seen early. The cornea is the poorest nourished tissue in the body, and in weaklings it disintegrates in spite of all measures, and the man who says all cases can be cured does not know what he is talking about; he has not had the experience. A canthotomy is a helpful procedure. What irrigating fluid is used is a matter of no great consequence; the idea is to cleanse the eye. He agreed with Dr. Hawley on the use of strong solutions of silver. The method of Betmann of Chicago, twenty years ago, was to use a five per cent solution the first day, a ten per cent on the second day, and if necessary, in twenty-four or forty-eight hours a fifteen per cent solution. He had followed that for years and had never seen any harm from it.

Dr. C. H. Francis called attention to a lid retractor which was useful in the irrigation of these cases.

Dr. J. C. Swan mentioned the importance of reduction in

the strength of the solutions and the danger of overtreatment as the patients get better, the presence of the microorganism being watched in smear preparations.

Dr. Oliver Tydings protested against the use of the strong silver solutions as being dangerous, at variance with his experience and with the pathology of suppuration, as well as capable of destroying an eye. Canthotomy is all right, and so is heat.

Dr. W. A. Hager had had three cases of gonorrheal ophthalmia in adults in the hospital at the same time under competent nurses. In one he used strong silver nitrate, in another protargol and argyrol, and in another nothing, and the results were the same in all—fifty per cent mortality. In children it is a matter of drainage. If the lids are swollen, split the canthus, irrigate with any solution and keep the lids smeared with a little vaselin. He had had a scar on one cornea.

Dr. M. Z. Albro thought an important thing was to open the eye at frequent intervals.

Dr. C. F. Burkhardt, in closing, again emphasized the importance of thorough cleansing of the eye, and admitted that perhaps he did not use strong enough solutions of the silver nitrate. He thought the agitation of the question of prophylaxis should be kept up. Physicians should be compelled to report that they had used proper prophylaxis; its neglect should be a finable offense.

Dr. Richard J. Tivnen then moved that the chair appoint a committee of three with power to act from any and every angle that seems desirable to promote practical measures for preventing the spread of ophthalmia neonatorum in the city and state.

The chair appointed Dr. Richard J. Tivnen, of Chicago, chairman; Dr. Albyn Lincoln Adams, of Jacksonville, and Dr. C. F. Burkhardt, of Effingham.

Meeting of February 16, 1914. President Dr. Wesley Hamilton Peck in the chair.

Partial Albinism; Eyes Only Affected.

Dr. W. E. Gamble reported a case of partial albinism of the eye without involvement of the hair or skin. The patient was eight months of age when first seen, at which time he seemed

to be blind. There was sufficient pigmentation of the irides to give to the casual observer the suggestion of a brownish color. The hair was then light brown, but is now quite dark. When sixteen months old his error of refraction (hypermetropia) was corrected, the lenses ground from number three London smoked glass. His vision has greatly improved so that now, when twenty-seven months old, he plays with small objects and other children. Judging from the darker color at the present time, no doubt the improvement is partly due to gradual deposit of pigment since birth. Lateral nystagmus is present.

Two Generations of Cases of Retinitis Pigmentosa in Which Heredity and Consanguinity Are Probably Etiologic Factors.

Dr. W. E. Gamble reported the case of Mrs. H., twenty-seven years of age, with retinitis pigmentosa. Her father and his brother and sister are victims of the same disease. The grandfather and father of Mrs. H. married first cousins.

The reason for presenting these cases is that in America it is rare to see two generations having the disease and having a clear history of consanguineous marriage. In the isolated mountain districts of southern Europe this condition is not so uncommon.

It is sometimes very difficult to distinguish this disease from widely diffused superficial choroiditis, with pigmentation of the retina and atrophy of the disc.

The diagnosis may be cleared by the history of syphilitic rentinochoroiditis with pigmentation of the retina and atrophy of the disc along with atrophic choroidal patches and pigment under the retinal vessels.

Discussion.—Dr. J. E. Colburn said he failed to note in Dr. Gamble's report of albinos whether there was an aberration of the color sense. In a series of cases he had followed some years ago were two, a brother and sister, that he had seen occasionally from childhood for twenty years, with complete albinism. There was absolutely no color sense.

In the other cases in which there was partial albinism they were absolutely blind to green; but with blue or yellow, or the combinations of blue or yellow, or the combinations of red or black or the grays, they had very good color perception. In a more recent case he found absolutely accurate color percep-

tion. Vision was a little low, but not materially so. Nystagmus is usually present, but not necessarily so.

Consanguinity, he thinks, holds in albinism as well as it does in the opposite condition. He gathered fifteen cases, in eight of which there was infant consanguinity, and three cases dated back to two generations, the first albinism occurring two generations prior to the one he saw.

An Anomalous Nerve Head With Good Vision.

Dr. Michael Goldenburg reported the case of a male negro, aged nineteen years, in which there was an apparent absence of both discs with marked pigmentation in the region of the nerve head. There was a history of eye trouble for the past six years, consisting largely in inability to read for any length of time without pain and excessive lacrimation. About five years ago the patient had glasses fitted by an optician. Examination of the eyes last October disclosed an alternating squint, with the right acting as the fixing eye, although vision was better in the left. Patient's vision with the right eye is 20/50, and 20/25 with correction. The tension, cornea, anterior chamber, pupillary reaction are all negative. The iris is heavily pigmented and dilates perfectly. The lens and vitreous are also negative. Examination of the fundus: Tracing the vessels from the periphery to the point of convergence did not seem to help in locating anything that might resemble a disc. However, at the point where the vessels apparently come together and where the nerve head should be, a very small intensely white spot was found. This spot could not be defined. The vessels appeared negative in every respect. The retina is normal with the exception of a marked pigmentation in the region of the nerve head, but gradually assumes a lighter shade toward the periphery. The fields of vision for color and objects are not markedly contracted, but appear serrated in outline.

Discussion.—Dr. Clark W. Hawley spoke of a case he exhibited before the society a number of years ago. There are one or two differences between the cases of Dr. Goldenburg and his, in that there was almost no pigmentation at the disc. The blood vessels seem to come out more as in the normal disc. Around the blood vessels the retina seems to be somewhat darker than the rest of the fundus. In one eye of this patient there was a streak which looked like a hyaloid mem-

brane. Vision was fairly good. There was some discussion at the time he exhibited the case as to whether it might be one of optic neuritis. A very careful examination of the case a number of times did not disclose anything which would point to an optic neuritis. In his case there was an absence of the disc. In Dr. Goldenburg's case the pigmentation, he thought, would indicate the formation of a disc with the pigment on top of it, but in his own case there was no disc.

Dr. Thomas Faith said that several years ago he reported in the *Ophthalmic Record* two or three cases similar to the one reported by Dr. Goldenburg. There was no pigmentation, but he thought it was proper to classify it under absence of the disc. The cases resembled very closely those of optic neuritis; the disc was swollen, with a difference of three or four diopters between the summit of the nerve head and the surrounding fundus. One of the cases had vision of six-sixths ($6/6$) in one eye, and less than that in the other. He did not remember the details, but was able to watch them for many months, so was satisfied he had a congenital anomaly to deal with. Taking the field a number of times showed a slight variation. There was no enlargement of the normal blind spot, and no evidences of inflammation, exudation, or hemorrhage in the retina or nerve head. One of the cases he has been able to see within the last few months and the condition is as it was a number of years ago. In the myopic case the myopia had progressed some. There was three-quarters of a diopter more of myopia than there was when he reported the case, yet there is no evidence of change at the margin of the disc. He referred to other cases in the literature.

Dr. Goldenburg, in closing the discussion, stated that in the *Ophthalmic Record* for 1901 he saw a report of Dr. Hawley's case; that vision was bad, no improvement with glasses. The report at that time was incomplete, and he could not get much information out of it. Dr. E. V. L. Brown, in discussing the case, was unable to find any evidence of the disc, but the vitreous changed quite a bit. He thought there were the remains of the vitreoglial structure. As to the absence of the disc, he assumed the attitude of an embryo ophthalmologist when he said it was hardly possible to have absence of the optic disc with vision. There was a case in an adult of absence of the optic disc, but he was totally blind.

In regard to his own case, he was in hopes someone would tell him something about the fields and clear up the point of how we were able to account for these constricted fields and serrated edges of the outline.

The Intracapsular Cataract Operation in Immature Cataract.

Dr. William A. Fisher pointed out two serious objections to the intracapsular operation: first, the want of an experienced assistant, and second, the great danger of loss of vitreous. The want of a properly trained assistant has always been considered sufficient cause to deter many good operators from attempting the intracapsular operation. Not underestimating the value of a good assistant, he thinks his double lid hook will simplify the assistant's part of the operation. Colonel Smith believes, with him, that an assistant can with this instrument be trained. However, if a skillful operator with a good assistant attempted the removal of a lens in its capsule before he knew how to introduce the Smith spoon in impending or actual loss of vitreous, he would soon meet with disaster.

It is not a difficult matter after cocainization of the patient for an assistant to become familiar with the lid hook, not only holding the lid away from the eye when expelling the lens, but also during the incision and the iridectomy. There are only two positions in which the lid should be held, and they should be thoroughly mastered by both operator and assistant before beginning so important an operation as the removal of the lens by any method.

The Smith spoon is not as easily placed behind the lens with the left hand as some may believe, but it is possible to get this technic by operating upon animals' eyes. After a very large experience with the intracapsular operation there was one thing he feared when he left India, and that was the introduction of the spoon to deliver the lens in impending or actual loss of vitreous. He operated upon more than one hundred eyes before he was permitted to use the spoon, and after that the loss of vitreous was not great enough for him to become proficient in the use of the instrument. When he returned to Chicago he made himself familiar with the introduction of the Smith spoon by practice on pigs' eyes placed in

a mask. The more skillful the operator in delivering the lens, the less often will he be called upon to use the spoon, but he must be prepared to use it at any time.

Dr. Fisher then described the method for operating on cataracts.

As to iridectomy, the method employed by Smith is not as simple as it appears, but any good operator should be able to do it with a little experience. It is not usually necessary to introduce the iris forceps into the eye, and if the ophthalmic surgeon insists in putting the iris forceps into the eye, he will be rewarded by some injured capsule which will prevent the removal of the lens in its capsule.

Some ophthalmic surgeons recommend preliminary iridectomy in certain cases, and he has in a previous paper recommended a preliminary iridectomy in all cases. Since his experience in India he feels that a preliminary iridectomy would be of advantage, especially to those who do not operate frequently.

Experience can only teach one how much pressure to make in delivering the lens: enough must be maintained to keep the corneal wound full of lens, otherwise vitreous will escape. The lens, being partially expelled and hanging in the wound, is extracted with the hook.

As to the toilet, the lid is held up and away from the eye by the double hook. The patient usually looks up, which position aids replacement of the iris. Should the patient not look up, he will do so on request. It is not necessary, but dangerous, to have the patient look down after the incision has been made. The iris is tucked back into the edges of the corneal wound with the Smith spatula, and the eyes closed. Any clean dressing that suits the operator will be proper, but Smith prefers to cover both eyes with a light dressing after the lashes have been covered with yellow oxid of mercury, one grain to the ounce. Whatever dressing is used, no pressure should be applied.

No matter what after-treatment is followed, the result will usually be good if the operation has been performed without accident. The less after-treatment the better. The dressing need not be removed for nine days unless the patient complains, and usually he is ready to be discharged at the first dressing.

Should an immature cataract be operated upon? If the

objections to the removal of the lens in its capsule can be overcome, the author thinks there is no need for a patient with beginning cataract to wait for maturity.

How far can one go with safety? If the lens does not present when the operator thinks he has made safe pressure, he can abandon the intracapsular operation and cut the capsule with a cystotome or capsule forceps and deliver in the old method with the new technic. He suggested the use of his capsule forceps, if any are to be used, because they can be introduced without having the patient look down.

In the intracapsular operation the lens can be removed as soon as the patient is unable to attend to his duties. The lens can be as easily removed at this time as any other, and he will be in better condition at this time than later.

Some ophthalmic surgeons, Dr. Fisher said, have an impression that Smith does all the intracapsular operations that are done in India. This is far from correct, but he is the foremost man in India. In the Punjab, where there are 20,000,000 inhabitants, there are about 25,000 cataract operations performed a year, and ninety per cent of them are intracapsular operations.

He believes that Smith's technic, when used in the capsulotomy operation, will do more for the cataract operation than all that has been done for it in the past one hundred years. If that technic is thoroughly mastered in the capsulotomy method, a good operator will not have much difficulty in removing the lens in its capsule.

As a word of caution, he urged that ophthalmic surgeons contemplating the removal of a lens in its capsule master the Smith technic and use it in their old operation, and not attempt to remove a lens in its capsule until they have thoroughly mastered the Smith technic and have used it in many capsulotomy operations. If they do not adopt the intracapsular operation, they will do better work by using Smith's technic in the capsulotomy operation.

Discussion.—Dr. Derrick T. Vail, Cincinnati, Ohio, said he has entirely abandoned the technic of the old operation. He has not used a cystotome since his return from India, four years ago. He has scarcely any use for a discission needle. He extracts in the capsule whenever it is possible in his hands to do so. He described the operation as it is done by Smith.

The incision Smith makes is the best incision for cataract that has ever been devised. The principle involved in brief is that of an angle hinge to a trap door. The fine point of the knife punctures the cornea at right angles to the limbus. The narrow blade is then turned flat in the plane of the iris and made to pass slowly through the chamber, but on emerging at the opposite side, the edge is turned up again to come out at nearly right angles to the limbus, and is then turned flat so that the edge, staying just within the cornea, severs it from the limbus with that one clean forward sweep. The effect of this technic was illustrated by diagram. Those two little angle cuts at the ends of the incision speak volumes for allowing space for lens emergence. Thus it is that Smith can cause an eye to disgorge a large lens through an apparently small incision with a minimum strain. The corneal incision opens, not like the jaws of a steel trap, on its resisting hinge, but more like the jaws of a snake whose articulations yield unresistingly.

As for the lid hook, he always uses it in every cataract operation when delivering the lens and dressing the wound. As for the lens hook, he uses nothing else for delivering the lens. As for the lens spoon, it is a great instrument and works well.

Dr. Fisher's argument favoring operation on immature cataracts, he thought, is unassailable. Personally, he operates on every case, no matter what kind of a cataract it may be, if the vision is at best 20/70 or less. He likes to operate on these cases; he does not dread it at all. If vision is 20/70 or thereabouts, his patient is still in prime health. He can also dilate his pupil and study his fundus. It is a source of immense satisfaction to have seen the optic disc and macular region just before operating.

A faultless skilled assistant is as essential as a good operator. The speaker's excuse for not delivering every case in the capsule is that he has not such an assistant as Nur Ali.

If Fisher's new lid hook will eliminate the danger of an untrained assistant, then he has conferred a priceless boon on Smith's intracapsular operation, and he prays it may be so.

Dr. William L. Noble described at length the operation as he saw Dr. Fisher perform it. He could not agree with Dr. Fisher that it is unwise to introduce the iris forceps into the

eye for fear of injuring the capsule. He could not see why there was any less risk in introducing one blade of the forceps into the eye over the iris, although one does not reach the pupillary margin of the iris, and the other blade outside of it and grasping the iris. The iridectomy was free. The operation as performed by Dr. Fisher, who had mastered the technic, was comparatively simple, although it involved the highest skill, in that he made no false motions.

Everything said about the double hook is justified. It increases the simplicity of the work of the assistant. He believes it is a physical impossibility to do the operation as described by Dr. Fisher with any degree of assurance of success with the ordinary speculum. The constant, persistent pressure of separating the lids with speculum is always annoying to patients.

As to the difficulty of placing the spoon behind the lens where vitreous engages in the wound, he fails to see why it should be such a hard thing to do. He could see no difficulty in getting the spoon behind the lens when the vitreous has once appeared. The next time he operates for cataract he will disregard the use of the speculum and employ the lid retractor in its place.

Dr. H. H. Browne said the inflammatory involvements, the accidents from the immediate operation and the necessity for secondary operations, made those who are doing private practice feel woefully lacking in the results they are obtaining.

As to the operation under discussion, he has seen the late Dr. Green operate after the Smith method three times; he has not had the pleasure of seeing Dr. Vail operate; he has seen Dr. Fisher operate once, and he was holding himself open to conviction. He feels that two things are essential for a successful operation. First, a larger experience than any man can obtain in private practice, therefore necessitating a large hospital and clinical experience to achieve the best results by the technic described. Second, it is necessary to have a corps of assistants more competent than those one is ordinarily accustomed to seeing in hospitals.

As to the use of the speculum, he has abandoned this as obsolete. Some means must be adopted to remove the pressure from the eyeball. He welcomes the Smith operation, and is personally grateful to Dr. Vail and to Dr. Fisher and others

who have sacrificed so much to bring this operation and its definite details to the immediate attention of the profession.

Dr. Oliver Tydings stated that the intracapsular operation for the removal of a cataractous lens, as performed by Smith, is the safest yet devised. The advantages gained in other things, such as freedom from postoperative inflammatory troubles, and after-cataract, were admitted by all. Is it possible for a good operator to so protect his patient in this operation as to make him as safe, or more so, than by the old methods? To this he would say yes. Dr. Vail had shown step by step how this work is done. He had also pointed out the two sources of danger to the vitreous. First, the pressure of the lids upon the globe before the zonula is ruptured. Second, the faulty use of the spoon when loss of vitreous is threatening. The advantage of Smith's method, when loss of vitreous was threatened, must appeal to all who have tried it.

Fisher has introduced some new features and devised two new instruments which add greatly to the safety and simplicity of the operation. First, the lid retractor which he gave to the profession ten years ago, the careful use of which aids in removing all pressure from the globe during the first part of the operation while the incision is being made. The most recent advance is the double hook. This replaces the single hook of Smith and does away with the necessity of a highly trained assistant. Any man who proposes to do the Smith-Fisher operation, should familiarize himself with the technic and thus be able to throw around the patient this additional security, while doing the operation with which he is most familiar.

Dr. Richard J. Tivnen stated that in November, 1911, there was a symposium on cataract held by the Chicago Ophthalmological Society. Previous to this meeting he sent a circular letter to ophthalmologists in the United States and received one hundred and fifty replies. Excerpts from the replies were read. In the circular letter this question was asked: "Have you performed the Smith operation of extracting the cataract in the capsule, the so-called intracapsular method? If so, in how many cases?"

Dr. Peter Callan, of New York, in his answer said that Dr. Green had operated on two of his patients with success. In regard to the Smith operation Dr. Callan said: "One should

not lose sight of the fact that Smith's patients are peasants, whose wants are few, and mental demands not great. Major Smith is in a class by himself, whose operations far outnumber those of any other surgeon, living or dead. What he can do and does with impunity should not be attempted except under very favorable circumstances in the general run of cases such as we have in the United States. I have no doubt a good operator under Smith's instructions would be expert in his method: still I do not consider it as safe as the usual operation with capsulotomy."

Dr. Tivnen stated that his excuse for quoting Dr. Callan was that his reply reflected his own views in the matter and those of others regarding the Smith operation in this country.

Out of one hundred and sixty letters received, one hundred and eleven replied they did not perform the Smith operation, and forty-nine replied they had done it.

A second question was: "Based on your practical experience, do you regard the Smith operation of dealing with the lens capsule superior or inferior to the usual capsulotomy method?"

Of the forty-nine who had performed this operation, eighteen considered the method superior to the capsulotomy method; seventeen considered it inferior, and in fourteen no opinion was expressed. Seventeen of the forty-nine who had performed the operation, and who considered it inferior to the capsulotomy method, each gave one of the following reasons: Danger of loss of vitreous, necessitating keeping an aged patient flat upon the back for a long period; unsafe to the average operator; corneal incision inferior compared with old methods; bandage left undisturbed for ten days is unsurgical and dangerous.

Eighteen of the forty-nine who performed the operation and considered it superior to the usual capsulotomy method, each gave one of the following reasons: Simplicity; less danger of infection; freedom from postoperative irritability; no secondary healing; better vision; ideal for immature cataract; better in selected cases," etc.

Dr. Thomas Faith said ophthalmologists performed simple extraction for a while and did iridectomy, and then went back to the combined operation for some time.

Smith has worked out a method of preparation of the patient

which is far superior to anything with which he is familiar. He does not know of any method of cleaning out the conjunctival sac like Smith does it, by using a lid hook and injecting bichlorid into the conjunctival sac, being careful afterward to milk out, as it were, the bichlorid solution from the conjunctival sac by pulling the lid toward the external canthus and allowing it to escape.

The technic of extracting the lens is far superior to the old method. By placing the hook on the lower margin of the cornea and keeping up pressure steadily, he has had the lens come out much cleaner than by the old method. Another thing which appeals to him is the Smith incision, which he did not understand until Dr. Fisher explained it.

He does not think applying a bandage over the eye and keeping it on for seven or ten days is unsurgical. One should not attempt to extract the lens and operate on the eye unless he is reasonably sure there is no infection present and the wound is clean. It is not considered unsurgical to tie up any other wound for several days, and why should it be unsurgical in the case of the eye?

Dr. George F. Suker said the extraction of cataract is the most delicate operation known to surgery, and appealed to him as the height of perfection in operative work. The greatest drawback to cataract extraction is the capsule. Whether much or little is left behind, it is always a bugbear. The only way to remove it is to take away the lens in its capsule.

As to the Fisher lid retractor, it is the best physical appliance he knows, in that it fixes the lid. One can raise the patient's head with it, and yet not have the point go beyond the upper edge of the tarsus. That being so, and the lower lid being fixed, if one applies the technic of Smith, as demonstrated by Vail, Green and Fisher, he will have as nearly an ideal operation as if he did the capsulotomy with it.

He mentioned a case on which he recently operated with a good result. By having the lid held by the Fisher retractor the patient is unable to do himself any damage. He is satisfied of that because the patient on whom he operated with the assistance of Dr. Fisher was unruly. Novices should begin to employ the technic with capsulotomy, and after they have done a number of these operations, they can try the Smith operation.

The hook in the delivery of the lens is far better than the ordinary method that has been in use. There is less damage done to the eye in delivering it in that way, and with the lid retractor and with the hook better results ought to be achieved. In removing the iris in doing an iridectomy, with one blade of the forceps on the cornea or pupillary area, and the other one on the upper edge of the wound, compressing the cornea, as it were, to squeeze out the iris and grasping the protruding iris, is good technic, but he agrees with Noble that a portion of the iris can be removed without injuring the capsule. Within a week or so in his service he has had two eyes (Dr. Fisher was present) on one of which a beautiful iridectomy was done by Dr. Darling, and vision in that eye today is 20/30. If the introduction of the iris forceps will produce trouble with the capsule, the patient would have 20/50 vision.

The Smith technic cannot be improved upon except by having such assistance as mentioned in the advice and suggestions given by Dr. Fisher, and that is by the lid retractor.

At the time of the symposium referred to by Dr. Tivnen, the speaker made the remark, and he believes it yet to be true, that the intracapsular extraction of cataract is suitable for two purposes: one the removal of hypermature cataract, and the other the immature variety.

In a case he saw Dr. Fisher operate upon, a little of the vitreous was lost, but Dr. Fisher did not use the spoon. Perhaps he did not think it was necessary to do so. While the amount of pressure in the removal of the lens seems enormous, if one tries it he will find it is not so. The introduction of the spoon is the preservation of the vitreous, giving it support, is as good mechanical appliance as can be had for the retention of the vitreous when it presents, because in delivery of the lens upon the spoon there is no pressure upon the vitreous, and the direction of the force is at right angles to the plane of the spoon, and the lens is parallel to that of the spoon, and it has got to come up perpendicularly; therefore, there is no pressure exerted upon the vitreous.

Dr. Fisher, in closing the discussion, thanked the members for the fairness they had shown in the intracapsular operation since he had returned from India. He had not noticed any opposition, and all who had witnessed his operation had expressed themselves as being interested. He sounded a

warning, namely, that any one contemplating the intracapsular operation should master the Smith technic, and especially the lid hook and spoon delivery in the old operation, before attempting the removal of a lens in its capsule. When this is mastered a tremendous step will have been taken forward in the cataract operation, no matter what method is pursued. In Smith's latest paper the visual results are the best that have ever been reported. Results of vitreous escape have been reported by Smith, Vail, Green, and himself. He believes the doctors who gave Dr. Tivnen adverse reports a few years ago would be more favorable to the intracapsular operation when they become more familiar with the Smith technic. He has never heard any unfavorable reports from any one whom he knew was familiar with the technic.

COLORADO OPHTHALMOLOGICAL SOCIETY.

Meeting of November 22, 1913. Dr. Edward Jackson presiding.

Dislocated Lens.

Dr. W. F. Matson presented a girl, aged fifteen years, whose left eye had been enucleated on account of a probable sarcomatous growth in the fundus, and whose right eye showed a dislocation of the lens down and in. The lens of the eye which had been enucleated, was also luxated, and both eyes had had attacks of glaucoma. The pupil contracted well under eserin, with improvement of vision. A minus 10 D. lens was worn over the right eye.

Discussion.—Dr. Coover stated that he had seen the patient in July, 1911, shortly before the left eye was enucleated, when she was suffering intense pain from glaucoma.

Dr. Black favored removal of the lens. He would try needling, subsequently doing linear extraction if glaucomatous symptoms developed.

Dr. Jackson would keep the pupil contracted with a miotic, and leave the lens as long as the eye behaved well. If extraction proved necessary, he would be inclined to remove the lens as a whole with a Levis loop. If the lens got into the anterior chamber before operation, he would contract the pupil with eserin before extraction. Dislocated lenses were usually smaller than normal, and so were less likely to cause trouble if they dropped into the vitreous.

Serous Uveitis With Exophthalmos.

Dr. Melville Black presented a case of serous uveitis in a man of forty-seven years, which had at first simulated glaucoma by apparent increase of tension, and was also of interest on account of an exophthalmos in the affected eye. The cornea was not entirely clear at the first examination. There was exophthalmos of about 5 mm., which had now diminished to one-half that amount. No explanation of the protrusion could be found in the nose. The Wassermann test was absolutely negative. The iris was slightly discolored and engorged, but there had been no pain, although pericorneal congestion was marked.

Discussion.—Dr. Patterson was not satisfied that there was no nasal complication. He would have a skiagraph made, in view of possible involvement of the posterior ethmoid cells.

Dr. Sedwick remarked that the patient had a very badly diseased molar tooth. A year previously he had seen a similar case, with pain and decided proptosis. The man's dentist had reported that there was no trouble with the teeth. Two or three months later there was a further attack, and another dentist found and pulled a diseased tooth, at the root of which was an abscess. The patient had had no trouble since that time, and had gained greatly in weight.

Dr. Bane, speaking of the influence of old gonorrheal infections in producing uveal inflammation, mentioned a case recently shown by Dr. Brown Pusey of Chicago, in which, after twenty years of liability to recurrent iritis, cure had resulted from the use of gonococcic vaccine.

Dr. Strader referred to a case he had seen, in which there had been a small corneal ulcer and some proptosis, with iridocyclitis; and in which the eye had looked practically well the day after extraction of a diseased tooth.

Dr. Crisp referred to the case of a man whose gonorrheal infection dated back twenty years, but who for the past twelve years had had recurrent attacks of iritis, the first of which had been contemporaneous with gonorrheal arthritis.

Optic Neuritis From Ethmoid Disease.

Dr. H. R. Stilwill presented a woman, aged twenty-eight years, who had come with a history of blindness suddenly developing a week earlier in the right eye. Examination of the right fundus had shown enlargement of the veins and some haziness at the inner margin of the disc. The left fundus was negative. On September 19th the rhinologist removed polypi and curetted the ethmoid cells. The patient stated that the vision of the left eye had become very poor the day before operation. The vision of the right eye, which before operation had been shadows, had improved to 20/40 on September 29th, the vision of the left eye on this date being also 20/40, as against 20/20 at the first examination. Since then the ethmoid cells on the right side had been curetted once, and on the left twice, and a few cells still remained to be removed on the right side. The sphenoids were negative.

The vision of each eye was now 20/20. The left eye showed a small hemorrhage at the temporal margin of the disc, and both discs were still hazy.

Discussion.—Dr. Finnoff, who had assisted at the nasal operation, stated that the polypi had completely obstructed both sides of the nose. Immediately before the first operation the patient had only light perception in each eye, and the vision commenced to improve noticeably the second or third day.

Dr. Coover thought an X-ray examination desirable in all such cases before and after operation.

Injury From Explosion of Dynamite Caps.

Dr. G. F. Libby presented a man, aged thirty-two years, who on October 1st had received injuries due to the explosion of a box of dynamite caps. The right eye had a penetrating wound through the sclerocorneal limbus, with a small iris prolapse, and there was hyphema in both eyes. The vision was light perception. X-ray examination showed pieces of copper in each orbit. It had never been possible to get a good fundus reflex from either eye. The blood had disappeared from the anterior chambers after about five weeks. The left pupil looked perfectly clear, and there was no lens opacity, yet the fundus could not be seen. Was this due to hemorrhage in the vitreous? The tension was minus in each eye.

Discussion.—Dr. Coover thought there were foreign bodies in the eyeball.

Dr. Black referred to a case in which a piece of copper had stayed for many years in an eye which nevertheless continued healthy. He mentioned another case in which, although no view of the fundus could be had for a long time after the injury, vision of 20/20 was finally obtained; but the eye was later lost from retinal detachment, probably due to the old retinal scar made by the copper fragment.

Dr. Jackson thought that the absence of reflex in the left eye was probably due to blood in the vitreous.

Albuminuric Retinitis.

Dr. G. F. Libby presented a woman of thirty-five years, who had been refracted on February 1, 1913, for headaches pointing to eye strain. The vision was then normal in each eye. A

week or so later the patient reported that the glasses had relieved the headaches. She came again in September, on account of headaches occurring every few days, and blurring of vision, which she associated with severe mental shock due to loss of her father last spring. On September 9th, right vision was 5/22 part, and there were a few dots on the retina and slight haziness of the disc. The family physician repeatedly reported the urine as normal, but finally found a trace of albumin. A week ago the pathologist had reported one-quarter per cent albumin and a few casts, mostly granular. For a time the vision had improved, but the patient caught cold and vision got worse, and the neuroretinal edema increased. Recently minute hemorrhages had appeared in the retina. The vision of the right eye was now 5/9 most. The blood pressure, taken tonight, was 220 mm. Hg. The left eye was not affected. The patient's menses had stopped four years ago and had not reappeared.

Discussion.—Dr. Black thought the prognosis very bad. He favored using nitrites, and would, if necessary, bleed, to lower the blood pressure.

Dr. Bane stated that the high frequency current reduced blood pressure.

Dr. Black declared that a Colorado röntgenologist, whose own blood pressure was high, stated that the high frequency current had very little effect on the blood pressure.

Dr. Sedwick suggested the use of chloral hydrate to lower blood pressure.

Dr. Jackson thought the prognosis a little more favorable because the condition was in a young patient and only one eye was so far affected.

(Dr. Libby since states that the fundus and vision have much improved under the use of catharsis and diaphoresis, together with four grains of chloral hydrate t. i. d., and that the blood pressure (December 20th) is 170 mm. Hg.)

Conical Cornea; Extreme Myopia; Dissection of Lens.

Dr. Edward Jackson presented a girl, aged nineteen years, whose right cornea was extremely conical on the temporal side as the result of a perforating trachomatous corneal ulcer. On account of myopia of about 16 D. the lens had been needled in June, 1912, entering a Bowman needle through the limbus

and giving a half rotation in the nucleus. Rather sharp reaction followed, with rise of tension. No further needling had been done, but absorption of the lens had continued until the early part of this year, and the pupil was now quite clear. The patient, however, in spite of the absence of the crystalline lens, got her best vision with a minus 18 D. lens, which gave $4/64$. Her best chance of further improvement would be to flatten down the conical cornea by some operation. It seemed that the slight opacity at the apex of the cone would be the natural place to apply the cautery, but statements had been made as to the production of sympathetic inflammation by cauterization of the cornea. A modification of Elschnig's operation for conical cornea seemed to offer the best prospects.

Discussion.—Dr. Spencer stated that in Fuchs' Vienna clinic there were many cases of retinal detachment which had occurred some years after the removal of the lens for high myopia.

Dr. Black was in favor of leaving the eye alone.

Elliot's Trephine Operation.

Dr. Edward Jackson made a statement concerning his impressions of the trephine operation for glaucoma, as demonstrated by Lieut.-Col. Elliot during his recent visit to the United States. Dr. Elliot, from an experience of 900 cases, some of which were done four years ago, regarded the operation as good for all cases of primary glaucoma.

Meeting of December 20, 1913. Dr. C. E. Walker, presiding.

Retrobulbar Neuritis.

Dr. W. A. Sedwick presented a man, aged forty-six years, who had come on November 24th, complaining of pain and loss of vision in the left eye during the previous three days. He had had asthma for five years, and had pulmonary tuberculosis. Wassermann test and examination of the urine were negative. A skiagraph having indicated possible involvement of the sphenoid, a nasal operation had been done, but without revealing any sinus disease. The left optic disc had been swollen 3 D., and this eye was blind. There had recently been slight swelling of the right disc. Tonight there was no

distinct swelling of the right disc, but vision of the right eye was reduced to 20/200. The left disc was no longer swollen, but slightly concave, and showed some beginning pallor.

Discussion.—Dr. Black suggested trying tuberculin, keeping well within a marked reaction.

Dr. Bane stated that the rhinologist had opened into the left sphenoid and found an immense cavity, but no suppuration. There had apparently been great reduction in the swelling of the disc since this was done.

Drs. Libby and Crisp were in favor of opening up the right sinus in spite of the absence of definite nasal indications, in view of the absence of other known etiology, and of the marked change which had occurred in the left disc since operation on the nose.

Interstitial Keratitis.

Dr. H. W. Aufmwasser presented a youth of nineteen years, who since October, 1912, had been suffering from interstitial keratitis. The right eye was first affected, the left becoming involved two months later. Both parents had died of tuberculosis, and the Wassermann test was positive. In March, 1913, there had been a swelling of the right knee, due to effusion in the synovial sac. The treatment had consisted of mercurial inunction, three doses of salvarsan, and the local use of atropin, yellow oxid of mercury, thiosinamin, and subconjunctival injections of salt solution and cyanid of mercury. The right eye was almost free from irritation, but the disease was still very active in the left.

Discussion.—Dr. Libby thought that the marked improvement in the right eye gave a favorable prognosis for the left.

Dr. Neepor would make another Wassermann test, upon the outcome of which further treatment should depend, anti-syphilitic remedies being pushed if it proved positive.

Dr. Patterson referred to a case of interstitial keratitis from congenital syphilis in a woman of twenty-three years, which had been considerably benefited by an intragluteal dose of salvarsan.

Bitemporal Hemianopsia.

Dr. W. C. Bane presented a woman, aged seventy-five years, who was blind in the temporal half of each visual field. Examination in 1909 had given very slight indication of some

disturbance in the nasal half of each retina. Corrected vision was: right, 5/10; left, 5/50. The discs were decidedly pale, especially the left. The patient had had an apoplectic seizure three months ago, but showed no present signs of paralysis. Her condition was otherwise normal for her age.

Discussion.—Dr. Black thought the possibility of a pituitary lesion should be considered.

Bandlike Opacity of the Cornea.

Dr. G. L. Strader presented a man of middle age who had had poor vision in both eyes since he was three years old, at which time he had a vague recollection of having had to protect his eyes against the light. He had been able to read until seven or eight years ago, and had never been able to get lenses which improved his vision. Each eye presented opacities, involving principally a broad area of the cornea, roughly corresponding to the palpebral fissure, but also present in lesser density in other parts of the cornea. The corneas were slightly conical, but correction, consisting of minus spheres with several D. of minus cylinder, improved vision very little. Very little gain was had from dilatation of the pupils. Vision was fingers at six or eight feet. For ten years the patient had had tic douloureux on the right side of the face, provoked by any slight touch on the cheek.

Penetrating Injury at Sclerocorneal Limbus.

Dr. Melville Black presented a boy, aged nine years, who seven weeks ago had been struck on the right eye by a blunt arrow, the result being a penetrating wound at the sclerocorneal junction, involving the ciliary body and iris. He had not come in from the country until three weeks ago, and it had been necessary to depend on home treatment with atropin and dionin. The vision was almost nil, the eye was getting worse, and enucleation had been advised, on account of the danger of sympathetic disturbance. Was it advisable to try the effect of iridectomy and removal of lens substance?

Discussion.—Opinions in favor of enucleation were generally expressed.

Meeting of January 17, 1914. Dr. A. C. Magruder presiding.

Burn Due to Molten Iron.

Dr. F. E. Wallace presented an iron molder who, on February 1, 1913, had received a splash of molten iron in the right eye. Four pieces of iron were removed from the cul-de-sac by the general physician. In spite of all treatment, extensive adhesion of the lower lid to the cornea had developed. The corneal burn had been so deep that the anterior chamber was almost perforated. After symblepharon appeared inevitable, the lower lid was loosened from the eyeball, and the defects covered partly with grafts taken from the left eye and partly with a conjunctival flap from the uninjured part of the right eye. The symblepharon was now worse, if anything, than before operation. The only thing left to do appeared to be a skin graft. Rather more than half the pupil was visible through the cloudy cornea, and the eye counted fingers. The bridge of adhesion had steadily advanced on to the cornea from an original point of attachment in the lower cul-de-sac.

Discussion.—Dr. Black thought the case a very difficult one. In making a skin graft it might be well not to attempt to pare the new tissue from the cornea at the time of grafting, but to leave that step until the inferior cul-de-sac had been reestablished, in order to avoid fresh adhesions.

Dr. Jackson would use a skin flap an inch and a half wide, on account of the shrinking which was sure to occur.

Burn From Caustic Soda.

Dr. W. C. Bane reported the case of a man who, while cleaning out a hose, had received a splash of the cleansing fluid into the left eye. The palpebral and bulbar conjunctiva and part of the cornea were burnt. On chemical analysis the cleansing fluid proved to be almost pure hydrate of soda. When the patient was seen, twenty-four hours after the accident, the burn did not seem to be severe, but next day the cornea looked hazy. The use of vaselin in the eye seemed to make it worse, and on Dr. Black's suggestion, a vegetable oil was used to advantage. This was the first case in which Dr. Bane had seen vaselin disagree with an eye. Collodion used in the lower cul-de-sac had seemed to give very good

results in preventing adhesions. In applying it the lower lid was everted as far as possible, a spatula held against the globe, and the collodion put on with a cotton brush. There was now an opacity three or four millimeters wide at the center of the cornea. The outer surface of the lid showed some wrinkling from the scar tissue, and would probably later be drawn away from the eyeball.

Discussion.—Dr. Black remarked that an extraordinary feature of this case had been what might be called a phimosis of the conjunctiva around and over the cornea, only one-fourth of which was for a time left exposed.

Dr. Neepor had been much pleased with the use, for this class of cases, of dental paraffin sheets. These could be cut into any desired shape, and so made to fit the whole conjunctival sac, both above and below, a hole being cut in the center to correspond with the cornea.

Buphthalmos.

Dr. James A. Pattee presented a girl of four years, whose right eye was greatly distended and almost blind. At the age of a week or ten days the parents had noticed that the eye was reddish, although there was no discharge; and when the child was about ten months old people began to notice that the eye was large. The cornea was hazy, and its diameter much greater than that of the other eye. The anterior chamber was deep, tension above normal, and the optic disc very much excavated, the retinal vessels breaking off sharply at the edge.

Discussion.—Dr. Jackson said it looked like a rather mild case of juvenile glaucoma or hydrophthalmos. If the eye continued to enlarge, he would be inclined to try the effect of trephining. But some of these cases seemed to have remained stationary.

Splinter of Wood in Anterior Chamber.

Dr. E. R. Neepor presented a boy of thirteen years, whose right eye had in March, 1913, been injured by a splinter of wood. The outer portion of the splinter was pulled away, and a spicule 3 mm. long and of hair breadth was left in the aqueous, extending from the lens to the posterior surface of the cornea. This was removed with great difficulty through

a keratome incision made near the limbus. The vision of the eye was now 20/20 — 1. There was a tiny corneal scar, a delicate scar representing the point at which the anterior capsule had been punctured, and a peripheral anterior synechia corresponding to the keratome incision. Dr. Neeper emphasized the importance in such cases of bringing the eye immediately under the influence of a cycloplegic.

Optic Atrophy From Cranial Injury.

Dr. E. R. Neeper presented a girl of eleven years who, at the age of six years, had bumped her head violently against that of a playmate, striking the left temple. She was blind and semiconscious for one week. Vision had failed gradually since the accident, and was now equal to counting fingers at from five to ten feet. There was horizontal nystagmus, and the optic discs were quite white.

Discussion.—Dr. Black: These cases were usually monocular, the fracture being commonly supposed to involve the apex of the orbit. In this case there had probably been an intracranial hemorrhage.

Dr. Patterson referred to a case of cranial injury in which, when first seen, the nerve head was swollen. It had proved to be a case of fracture at the base of the skull.

Dr. Neeper mentioned the case of a man who had been beaten up while drunk. Vision was absolutely lost from the time of the injury. There were repeated hemorrhages from one nostril, and though at first nothing abnormal could be seen in the fundus, the later appearance was that of complete atrophy of the optic nerves.

Herpes Zoster.

Dr. E. R. Neeper presented a man of fifty-four years, who had had a herpes zoster involving the right side of the face and the right eye, but exceptional in that there was an extension of the vesicles over the lower half of the left side of the nose. In the earlier part of the attack there was moderate delirium. The congestion of the right eye had been most marked in the lower nasal quadrant, and the eruption on the right side was chiefly limited to the nose. While the first complaint of pain referred to the eye, the appearance of the

eruption on the nose was followed by severe cyclitis. There was a history of working hard and cooling quickly a few days before pain began. The neuralgic pain was on the right side of the head, and did not involve the disturbed area on the left side of the nose.

Discussion.—Drs. Bane and Crisp referred to a case recently seen, in a patient who had been sent to the isolation hospital for supposed erysipelas. The ocular disturbance had been limited to some pericorneal and conjunctival congestion, photophobia, and a slight contraction of the pupil on the affected side, on account of which atropin was used.

Interstitial Keratitis Following Smallpox.

Dr. A. C. Magruder presented a man, aged thirty-six years, who, after a mild eruptive illness, which by the patient's description must have been smallpox, had developed an inflammation of the right eye. He also gave a history of exposure to severe cold not long after getting over the general ailment. The eye had not been involved at the time of the general eruption. When seen on December 26, 1913, there was a general ground glass appearance of the entire cornea except the upper central area, which was clear enough to give an indistinct view of the pupil. There was complete posterior synechia. Nocturnal pain and photophobia were intense, and there was extreme congestion of the conjunctiva. The upper central part of the cornea now showed what appeared to be a large abscess in the corneal substance. The onyx had for some time been ring-shaped, the center being much clearer. It had never been possible to stain the cornea. There was no history of syphilis. The treatment used had included atropin, potassium iodid, mercury, the high frequency current, dionin, and general tonics. In order that the patient might pass a fairly comfortable night, it had been found necessary to use the high frequency current at about three or four p. m.

Discussion.—Dr. Robinson had seen a case of interstitial keratitis following smallpox.

Dr. Patterson favored making a Saemisch incision in Dr. Magruder's case.

Scleral Trephining for Glaucoma.

Dr. A. C. Magruder presented a man on whose right eye scleral trephining had been done seven months previously for the relief of severe pain. The vision of the eye had been entirely lost before operation, and was not recovered; but the eye had been comfortable since. The pain in the eye had been accompanied by pain in the ethmoid area, which persisted after the eye operation; so that an exenteration of the ethmoid was done four days after trephining.

Intracranial Tumor; Choked Disc; Hemianopsia.

Dr. A. C. Magruder presented a woman, aged forty-four years, who, since the beginning of the first menstruation after the birth of her last child, six years back, had suffered from severe headache which had never entirely left her except for a few days midway between her periods. Of late she had never been entirely free from headache. Severe pain usually came on about one a. m., with such severity that the patient had to get up and walk the floor. She had frequently lost consciousness. There had been ten children, of which eight were living; and only one miscarriage. Examination of the nose, and the Wassermann reaction, were negative. In the past six years the patient had taken on fat to a marked degree. Both discs were choked, and the visual fields showed left homonymous hemianopsia. A skiagraph indicated no enlargement of the sella turcica, but a shadow in the sphenoid region. Examination of the urine after the ingestion of glucose suggested pituitary involvement. The internist and neurologist confirmed the diagnosis of brain tumor, and spoke doubtfully of the advantage of a decompression operation.

Discussion.—Dr. Black thought the patient should be given the possible benefit of a decompression operation, by which the headaches were likely to be relieved and the vision improved to a marked degree.

Dr. Jackson suggested that the connection of the headache with menstruation might have some importance. Cessation of menstruation at an early period in life was one of the symptoms in some cases of pituitary involvement.

Dr. Black mentioned the case of a woman who, after childbirth in September last, had noticed a disturbance of vision,

of which, however, there had been some beginning during the previous year. The tumor was diagnosed as situated subcortically in the right parietal region. Insertion of a trochar behind the Rolandic area of the brain opened a cyst containing about five ounces of fluid. The patient died not long afterward.

(Dr. Magruder reports later that his patient died on the operating table after taking about one dram of ether, and before an incision had been made. At autopsy an almost globular, hard, encapsulated tumor, 70 mm. in diameter, was found in the posterior part of the right frontal lobe. The anterior aspect of the tumor was almost in relation with the optic chiasm. There was also a small cyst of the hypophysis.)

Meeting of February 21, 1914. Dr. Melville Black presiding.

Retrobulbar Neuritis.

Dr. Hiram R. Stilwill presented the man who had been shown by Dr. Sedwick at the December meeting on account of loss of vision of the left eye. The vision of the right eye, which early in the history of the case had fallen to 20/200, had subsequently risen to 5/7. Then on January 23d, in the course of a few hours, the vision of this eye had been entirely lost. The patient came in with the right disc swollen and hazy. Exploratory operation on the ethmoids and sphenoids of this side gave negative findings. There had been no improvement in vision. There was still some blurring of the fundus details, but the disc looked more or less atrophic.

Neuroretinitis.

Dr. Otis Orendorff presented a case of neuroretinitis with weblike vitreous opacities. The patient thought this trouble due to snow blindness, as he had been hunting in the mountains shortly before the disturbance began. There was no history of syphilis. Slight improvement of vision had occurred after repeated subconjunctival injections. Mixed treatment had been given.

Discussion.—Dr. Spencer would not attach much importance to the negative history, and would have a Wassermann test made.

Dr. Carver would even give salvarsan, without waiting for a Wassermann test.

(Dr. Orendorff later reports Wassermann negative, and is strongly disposed to regard the condition as due to snow blindness.)

Recurrent Keratoiritis—Macular Choroiditis.

Dr. F. R. Spencer presented a woman of sixty-six years, who for five years had suffered from repeated attacks of keratitis and iritis in the right eye. The right cornea was diffusely and irregularly opaque and its surface uneven. There was a scanty deposit of lime. The irregular pupil was faintly visible. There was decided pericorneal injection. The left cornea showed a thin central interstitial opacity. In the region of the left macula, reaching to the disc and downward, was a large area of choroiditis. A diagnosis of a typical sclerosing keratitis had been made.

Discussion.—Dr. Coover thought an iridectomy would tend to diminish the right corneal opacity.

Dr. Black thought any operative interference would be dangerous.

Traumatic Cataract.

Dr. J. G. Schall presented a man of thirty-three years, whose right eye had on January 25th been struck by a piece of coal slag. The only corneal evidence of the injury was a crescentic shallow scar 3 or 4 mm. long opposite the upper edge of the pupil. The iris was not adherent to the cornea. The lens had become cataractous within forty-eight hours. Later the anterior capsule ruptured, and lens substance and a shred of the capsule were now floating in the anterior chamber. Had the eye been penetrated by the foreign body?

Discussion.—Dr. Matson thought the wound a penetrating one.

Dr. Jackson thought the lens capsule might have burst simply as a result of rapid swelling of the lens.

Several members failed to understand how the cornea could be laid completely open without any trace remaining of contact of the iris and capsule with the cornea.

Injury by Broken Spectacle Lens.

Dr. C. O. Eigler (by invitation) presented a man of fifty-seven years, whose left eye had been lacerated by a spectacle lens which had been broken by a piece of kindling. There was an L-shaped cut in the cornea, the lens was hazy and displaced into the anterior chamber, and tension was becoming elevated.

Discussion.—Dr. Jackson thought the eye might not quiet down until the lens was disposed of.

Dr. Black criticised the fact that eserine had been used, inasmuch as the rise of tension was due to swelling of the lens.

Suspected Hypophyseal Disease.

Dr. D. A. Strickler presented a woman of forty-nine years, whose history was suggestive of hypophyseal disease. In the past ten years she had had almost constant headache, and her weight had increased from 140 to 210 pounds. Her size of glove had increased from 6 to 7¾, and of shoe from 5 to 6-EE. The features had enlarged. Vision had fallen to right, 20/40; left, 20/40, with correction. The fields were greatly contracted above, below and on the temporal side. The patient stated that she saw double in the right eye. The temperature was slightly elevated today. An X-ray plate did not show the posterior clinoid processes. An internist had favored a diagnosis of acromegaly. There were no fundus changes.

Discussion.—Dr. Spencer thought tests regarding the labyrinth might give information as to intracranial involvement.

Dr. Magruder suggested that the sugar tolerance should be tested. There was usually increased tolerance in pituitary lesions.

Traumatic Cataract.

Dr. E. E. McKeown presented a man of twenty-eight years, who, while cleaning a chicken house, had been struck in the eye by a foreign body. The fact that a hammer was used made it possible that a piece of steel might have entered the eye. There had been hypopyon on the second day, and paracentesis had been followed by improvement. Development of cataract began two weeks after the injury. Needling had been done four months after the injury, and vision was improving slowly.

Discussion.—Dr. Libby would make a four millimeter opening in the lens as soon as vision ceased to improve.

Dr. Black advised skiagraphy to settle the question as to the presence of steel in the eye.

Dr. Jackson thought the history of early infection favored the presence of steel in the eye.

Brain Tumor.

Dr. A. C. Magruder reported that the woman with left homonymous hemianopsia, shown at the January meeting, had died shortly after the commencement of ether anesthesia for intracranial operation. At autopsy a large, almost spherical tumor (as mentioned in a note to the previous report) had been found displacing the right posterior occipital lobe of the brain. The brain and tumor were demonstrated. Microscopic examination had shown the tumor to be a spindle cell sarcoma.

Syphilitic Iridocyclitis.

Dr. Melville Black presented a case of luetic iridocyclitis which had rapidly improved under doses of 0.6, 0.8, and 1. g. of neosalvarsan, given at short intervals. Mercury was now being given by inunction.

Birth Injury—Sympathetic Irritation.

Dr. Black presented a patient, aged twenty-two years, whose left eye had been injured at birth. The left lens was densely opaque, and the pupillary margin adherent except above. The right eye showed some injection and its accommodation was only 5.5 D. Should the left eye be removed?

Discussion.—Dr. Matson thought it would be risky to leave the eye in.

Dr. Jackson thought the lower accommodation of the second eye was probably not sympathetic. Low accommodation may occur normally in some young persons.

Perforating Injury—Traumatic Pterygium.

Dr. Black presented a man of sixty-three years, whose right eye had been injured by a gun explosion in 1868, and last August by perforation with a piece of wire. The eye was painful and inflamed, vision nil, and a fleshy pterygium-

like growth extended far across the cornea. Should any operation other than enucleation be attempted?

Discussion.—Dr. Spencer thought it would be safest to enucleate.

Dr. Jackson would keep enucleation for the last resort.

Burn From Bichlorid of Mercury.

Dr. Black presented a man whose right eye had been burned by explosion of a bottle containing bichlorid of mercury. The day after the injury almost the whole corneal surface had stained with fluorescein. The treatment had been atropin once daily, pure castor oil instilled every two hours, and frequent cleansing with boric solution. The membrane which had first formed over the cornea and conjunctiva had since disappeared. The eye was somewhat red, but there were no adhesions. (Dr. Black later reports complete recovery.)

Burn From Caustic Soda.

In Dr. Bane's absence, Dr. Black showed the patient presented by Dr. Bane at the December meeting on account of a burn from caustic soda. This eye, which had seemed for a while to be progressing favorably, had become very much worse, the lower fornix being entirely adherent, and the cornea very opaque and vascular.

Sarcoma of the Cornea.

Dr. Melville Black and Dr. W. H. Crisp demonstrated a microscopic section from a corneal growth removed by Dr. Black, which proved to be spindle cell sarcoma. The tumor, which had been developing for about three years, was of pearly gray color, covered almost the lower outer half of the cornea, and extended slightly on to the conjunctiva, and had the clinical appearance of a papilloma. It had been excised, with thorough curettement of the underlying and surrounding tissues.

Retinal Detachment With Cystic Degeneration.

Dr. J. W. Lelhan showed gross specimens of an eye which had been enucleated on account of supposed intraocular tumor. The patient, a boy of sixteen years, gave a vague history of injury, and came on account of failure of vision and severe

pain. At examination the tension of this eye was 70 mm. of Hg. The fundus was nowhere normal, and nowhere distinctly seen. A large central area was made out, covered by numerous small vessels. There were several large white areas and a number of irregular masses of pigment. Tentative diagnosis of probable sarcoma had been made. The bisected eyeball showed general detachment of the retina, which lay about two-thirds of the way forward towards the lens, and was covered in front with a number of large cysts. Microscopic examination would be reported later.

Albuminuric Retinitis—Chloral Hydrate to Reduce Blood Pressure.

Dr. G. F. Libby made a supplemental report on the case of albuminuric retinitis presented in November. Under chloral hydrate, 4 gr. b. i. d., sweating, and catharsis, the blood pressure had been brought down from 220 to 165 mm. of Hg. The patient had lately omitted the chloral hydrate for two weeks, and the pressure was up to 180 again, although diaphoresis had been kept up regularly. The retinal exudate was almost all absorbed, and the patient had kept at her work as teacher.

WILLIAM H. CRISP.
Secretary.

OPHTHALMIC SECTION
ST. LOUIS MEDICAL SOCIETY.

Meeting of June 4, 1913.

Report of Case.

Dr. F. Parker: Mrs. R. C. was admitted to W. U. Hospital Clinic on May 22, 1913, with the following history: Three days previous she had headache and the vision in the left eye began to fail. Five years ago right eye was affected and the vision lost. Family history, physical examination, von Pirquet and Wassermann negative. Blood pressure 100. Urinalysis examination normal. Ophthalmoscopic examination: Right eye, old choroiditis in macular region, stellate in outline. Vision, right eye, shadows; left eye, 15/150. Extending from macula down, on outer side, are large yellowish spots in choroid. The overlying retina is cloudy and gray. The reason for presenting this patient was to determine the cause of the condition if possible.

Discussion.—Dr. Ewing: Has there been a sinus examination made of this case? I think that such an examination is advisable.

Dr. Parker replied there had not been any sinus examination made.

Further Report on the Case of Bitemporal Hemianopsia Presented
March 5, 1913.

Dr. Julius H. Gross: The patient, a widow, aged sixty-four years, gave a history of failure of vision, dating back about six years. The general condition was as follows: She felt fairly well, slept somewhat more than normal, had excessive thirst, and perspired easily on left side of face and body; had goiter, the left lobe of the thyroid especially was large, and there was a fair percentage of sugar in her urine.

Condition of eyes: Right eye, blind; left eye, vision 18/19. The temporal side of field, except a small part, about fifteen degrees near the fixation point, was lost. There was interlacing of the red and green color fields. Wernicke sign present;

the pupils contracted in accommodation. The movements of the globe were normal, the optic papillæ grayish white, the fibers of the cribriform fascia distinctly visible, the vessels of normal size.

The X-ray picture indicated that the sella turcica had been obliterated, probably by a neoplasm.

Surgical Aspects of Case.—Dr. Ernest Sachs, to whom the case was referred, reported as follows: The noteworthy features of the case were that this patient evidently had been suffering from pressure of the pituitary tumor on her optic nerves for over five years, and though her optic nerves showed marked changes, there was no evidence of intracranial pressure or involvement. The only other symptom she had was a persistent glycosuria. As is frequently the case in pituitary tumors, there was little or no headache, and no vomiting. As a rule, when these symptoms develop, the tumor has perforated the dura and grown into the substance of the brain.

This patient, on account of the complete loss of vision of the right eye, and the partial involvement of the left, was operated on with the hope of saving the sight of the left eye. As the X-ray indicated that the tumor had grown downward and burrowed through the floor of the sella turcica, the nasal approach by the intralabial route employed by Kanavel and Cushing was employed. The specimen removed at the time of operation proved to be an adenoma of the pituitary.

Forty-eight hours after operation the patient, who had been doing well and was comfortably sitting up in bed, suddenly fell over with respiratory failure, and though artificial respiration was done for some time, as the heart was still beating, died.

Autopsy revealed a large tumor, the size of a hen's egg, which had not only grown down in the sella turcica but upward, compressing the third ventricle and causing pressure atrophy of the right optic thalamus. The tumor had grown through the circle of Willis, forming a collar constriction about at its middle; besides, the pancreas showed a marked hypertrophy of the islands of Langerhans, which accounted for the glycosuria. (The specimen was demonstrated as well as sections showing the tumor and degeneration of optic nerves and chiasm.)

Some have advocated operation through the nose, while others, notably McArthur and Frazier, have advocated turning down a large frontal flap and resecting the supraorbital plate. Horsley has done a two stage craniotomy, lifting up the temporal lobe and approaching the pituitary from the side. In my opinion, no one of these methods is to be used to the exclusion of all the others, and it is my feeling that in the cases where the tumor had grown downward into the sphenoidal sinus, the better approach is through the nose, and where the tumor had grown up, the method of McArthur is more desirable.

In this case no operative procedure could have been of any avail, in view of the relation of the circle of Willis to the tumor. Furthermore, there was no way of determining beforehand that the tumor had grown upward into the brain, as was shown by the autopsy.

The most we can do in many of these pituitary cases is to relieve symptoms and save the eyesight. I believe removing the tumor in this region will, in the majority of cases, not be possible, unless they be cystic. This case, however, again emphasizes that to help we must see the patient early in the disease.

Discussion.—Dr. Hoge: I might ask if there were any motor or sensory symptoms found?

Dr. Sachs: None whatever.

Dr. Gross, in closing: I would like to say that I sincerely regret that all did not see the patient when she was presented, since it has proven to be such an unusual and exceedingly interesting case.

Dr. Luedde: I would like to ask Dr. Sachs if there is greater danger of postoperative infection in the intranasal method than in the external cutaneous operation?

Also Dr. Sachs' reference to the presence of sugar in the urine as an early sign of pituitary disease, reminds me of a case which I saw about four years ago. This was a young lady, about twenty-two years of age, referred to me from Springfield, Illinois, on account of extensive hemorrhages in the retina in one eye, which the examination by an oculist there had revealed several weeks before. The patient had been told that she probably would die soon on account of serious kidney disease. The fact that only one eye was involved, the

other eye being perfectly normal, caused me to insist upon a very careful nasal examination. This examination by Dr. Sluder revealed a severe sphenoidal suppuration. The examination of the urine, made by the late Dr. Rush, showed a small per cent of sugar and a trace of albumin. In the absence of careful examination of the nose, the presence of sugar in the urine might have been taken as an indication of diabetes, thus the hemorrhagic condition in the retina could be accounted for by severe constitutional disease. However, with the clearing up of the sphenoidal suppuration, the sugar disappeared from the urine. Dr. Sluder and myself considered this an evidence that the severe infection of the sphenoidal sinus had produced some irritation of the pituitary body. The patient has been under observation repeatedly since that time; there has been no recurrence of sugar in the urine, the retinal picture returned to normal, and vision is perfect in each eye. I have referred to this case because it is one that made a profound impression on me at the time and has fixed in my mind this symptom of sugar in the urine to which Dr. Sachs has referred in connection with early diagnosis of pituitary disease.

Dr. Sachs, in closing: The objection which has been raised to the operation through the nose is that one cannot work through an absolutely sterile field, but with care not to operate while a catarrhal condition is present, or when a patient is suffering from a cold, one is comparatively safe, for the nose is said to contain no pathogenic organisms except at such a time.

I would like to ask a question. A number of years ago, Dr. Adolph Meyer, of Johns Hopkins Hospital, pointed out that there was a separate series of optic nerve fibers running in the temporal lobe, and in a number of early cases Dr. Cushing was able to find an incisura in the color fields in the upper and outer quadrant. This was only to be demonstrated when the fields were taken every fifteen degrees, and he believes that this is one of the earliest symptoms of pituitary disease. The subsequent course proved that these patients had a pituitary tumor. Unless these fields are taken every fifteen degrees such a defect is missed, and it seems to me, therefore, of tremendous importance, and also emphasizes what Dr. Wiener has said, of taking very careful color fields even

when there is but a remote possibility of intracranial trouble.

I should be glad to know whether such a defect has been a common observation in the practice of any of you.

Meeting of October 1, 1913.

Severe Iridocyclitis With Hypopyon Following Cataract Extraction —Recovery With Excellent Vision.

Dr. John Green: Following cataract extraction a mild form of iritis which yields readily to mydriatics is not unusual. Inflammation of the iris of the plastic type is also encountered. Such an eye is seriously compromised. The outlook is even more dubious when, in addition to the signs of plastic inflammation, hypopyon develops. Under these conditions the therapeutic resources of the surgeon are taxed to the utmost, and a favorable outcome is to be hoped for rather than expected.

An Irishman, aged sixty years, was operated on by the combined method, April 22nd. The wound healed by first intention. Five days after operation iridocyclitis developed, followed the next day by the appearance of hypopyon, which extended one-fourth upward in the anterior chamber. Rapid improvement and ultimate cure with good vision followed the exhibition of large doses of urotropin.

Gradle found that in rabbits urotropin was excreted into the anterior chamber three hours after ingestion. It is probable that in the concentration in which urotropin is excreted in the aqueous (about 1:75,000), it will at least weaken infecting organisms sufficiently to allow them to be more easily attacked and killed by the normal antibodies in the various secretions.

I cannot disabuse my mind of the conviction that in this case an endogenous infection which was rapidly becoming virulent was converted into a milder form by increased antiseptics of the aqueous through the excretion of urotropin.

Discussion.—Dr. Rosebrough: Knapp, in his chapter upon operations in "A System of Eye Diseases," edited by Norris and Oliver, mentions the possibility of the formation of a gelatinous exudate in the anterior chamber, which begins with a great deal of pain, rapidly forms and just as rapidly disappears. He compares it to the same sort of exudate as is found in gonorrheal iritis.

I think Dr. Green is to be congratulated upon the happy outcome of his case, and I should like to mention a case of my own, which I am quite sure was not endogenous, but occurred from an external infection. These cases are more interesting to discuss in a theoretic way rather than to treat in actual practice.

The patient was eighty-eight years old, and the eyes deeply situated in the sockets. Because of the depth of the socket I had difficulty in making the paracentesis, which, when completed, was too small. Upon enlarging the paracentesis with Stevens scissors, fluid vitreous escaped, the eyeball partially collapsed, and the lens was successfully delivered with the Weber loop. Two days later the patient, who had lost his sense of orientation and had slight delusions at times, tore the bandage off twice in succession, but upon examination the anterior chamber was restored and the pillars of the coloboma in situ. Upon the third day there was a grayish infiltration in the nasal side of the cornea and a small quantity of yellowish exudate in the pupillary area. I could trace the path of infection from the nasal side of the cornea to the pupillary area, for there was a distinct hazy line extending to the pupillary area. The patient had slight periorbital pain, but none of a severe nature. There was no increase of the infiltration of the cornea, nor in the quantity of exudate in the pupillary area. It remained stationary, being encapsulated in the remnants of the lens capsule. The conjunctival sac was repeatedly cleansed with antiseptic lotions; iodoform at first and xeroform later was dusted upon the cornea, atropin instilled and hot applications applied. In a month the cornea cleared, the exudate disappeared and the pupil was drawn upward. The patient had perfect light perception. Further operative interference was refused six months later because of the patient's failing health.

Dr. Hardy: I would like to ask Dr. Green how much urotropin and for what length of time he used it?

Dr. Green, in closing: A gelatinous exudate appearing in the pupil after extraction is an exceptional occurrence, and I recall having encountered this condition only once. The mass was thick and tenacious and did not vary in contour or position with varying positions of the patient's head. It disappeared finally without leaving any trace. The exudate in this

case was distinctly fluid, flowing to the right when the patient lay on his right side and vice versa—a true hypopyon. In reply to Dr. Hardy's question, seventy-five grains of urotropin were given daily for three days; thereafter thirty grains daily for two weeks. At no time was there any hematuria, although, as I recall it, there was a little vesical tenesmus at one time.

Embolism of the Central Retinal Artery With Partial Preservation of Vision.

Dr. W. Luedde: The case here presented came to my office yesterday, stating that about sixteen hours before, the right eye had suddenly become blind; that she could only see a little spot to the right side of the center with this eye. She is a housemaid, single, twenty-three years of age, apparently in good health. The ophthalmoscope immediately revealed the striking picture of embolism of the central retinal artery, but instead of the single cherry red spot at the macula, there remained, apparently intact, an area of the retina between the macula and the disc. This remnant of healthy retinal tissue was explained by finding a cilioretinal vessel, which passed in the direction of the macula from the temporal margin of the disc. No heart lesion has been discovered, although the patient was carefully examined by Dr. Hempelmann. Blood pressure was 120 systolic; 70 diastolic. Urine showed a trace of albumin; microscopic examination negative. Examination of the nose and throat by Dr. F. C. Simon was negative except for a slight varicosity at the base of the tongue. The other eye was entirely normal. Patient's vision today is 16/150 in the affected eye, and 16/10 in the normal eye. I have brought her to the meeting tonight because these cases are always of interest when of recent occurrence, as in this instance, and on account of the unusually fortunate deviation from the common picture of retinal embolism by the preservation of a small sector of the retina intact.

(A recent examination of this patient by a gynecologist has made it appear likely that the embolism in the case presented October 1st was the result of an imperfect abortion.)

Discussion.—Dr. Green: I had the pleasure of seeing this patient yesterday. Today the arteries are distinctly narrower, indicating an arterial block. Yesterday there was hardly any indication as to the site of the lesion, whether in the artery

or vein. I would like to ask Dr. Luedde what therapeutic measures he has adopted so far?

Dr. Luedde, in closing: Among the therapeutic measures which I adopted was principally pressure on the globe, which made absolutely no difference so far as I could determine. I did not use the amyl nitrate, because I believed it too late to do any good. Also I waited until Dr. Hempelmann had made his examination, to see if there might be any contraindications to its use. I do not believe that fifteen or sixteen hours after the plug has lodged in the central retinal artery these measures are of any benefit. It is a question whether any one has ever seen any therapeutic success. In conversation, Dr. Alt referred to a case today of a man who came to him right after retinal embolism. He said he massaged him until this eye became too tender to continue, but it made absolutely no difference in the condition. I think those cases that respond to any treatment are probably fortunate accidents—something like a case I had about a year and a half ago. A young woman partially cured herself. Total blindness was followed, after several minutes, by blindness affecting the upper one-half of the field. On examination it proved that this embolism had slipped into the inferior temporal branch. It may be that a person thus afflicted might produce by strenuous exercise, a drink of whiskey, aromatic spirits of ammonia, amyl nitrate, or any strong cardiac stimulant, an immediate circulatory impulse which would dislodge the plug and rush it toward the periphery of the retina and gain an area of good sight. Usually, however, these methods cannot be attempted until the plug is firmly lodged in the central artery. It seems to me more rational thus to exert pressure through the impulse of blood column behind the obstruction than to dislodge the plug by pressure on the globe.

Keratitis Disciformis—Prompt Recovery Following Subconjunctival Saline Injections.

Dr. John Green: The patient, a healthy farmer, aged forty years, presented a circular gray infiltration of the cornea, which, under magnification, was seen to be made up of closely packed roughly circular dots. The clinical appearance was characteristic of keratitis disciformis. Treatment for three weeks with hot saline irrigations, five per cent argyrol and

dionin solution, failed to effect any notable change in the appearance of the lesion. Patient was then given, subconjunctivally, fifteen minims of a two per cent saline solution. Within a week the area of infiltration had shrunk and was thinner. Several repetitions of the injection resulted in complete subsidence of the inflammatory process with a coincident rise in vision.

This type of keratitis has generally been regarded as a self-limited disease, practically uninfluenced by any form of treatment and terminating in more or less opacity, due to the formation of scar tissue. The improvement and rapid cure following repeated subconjunctival injections of a two per cent saline solution, after the failure of classical methods, suggests that, after all, the course of the disease may be shortened and the final outcome restoration without serious impairment of vision.

Discussion.—Dr. Post: I would like to ask Dr. Green what amount of pain follows the saline injections?

Dr. Green, in closing: There is very little pain with a two per cent solution, but there is more pain than with a normal solution. I am injecting it at the Children's Hospital in the case of a very neurotic child with interstitial keratitis, without serious protest on the part of the patient.

Crossed Cylinders in Irregular Astigmatism.

Dr. F. E. Woodruff: The report of these cases has to do solely with the correction, as far as may be possible, by means of lenses, the irregular astigmatism, whether due to faulty or irregular curve of the cornea, displacement of the lens, or variations in the density of the various sectors in the lens. By irregular astigmatism I refer to those cases of astigmatism in which the meridians of greatest and least refraction are not at right angles to each other. Consequently, it is impossible to make use of a spherical lens in combination with any cylinder.

The irregular astigmatism may be of the compound hyperopic, compound myopic or the mixed variety. It may also be with or against the rule. An irregular astigmatism in the lens, due to varying density in the sectors of the lens, accounts at times for monocular diplopia, especially in incipient cataract. The condition of vision in these astigmatics can be well com-

pared to vision obtained when looking through an uneven pane of glass with irregular surfaces.

I shall not go into detail regarding the causes of this condition; but in general, trachoma followed by ulceration or ulceration uncomplicated had preceded these tests. In none had less than one and a half years elapsed between the time of the ulceration and the refraction. In one, nine years had elapsed, and the others had existed for some years. In none was there an incipient cataract present nor any acute inflammatory trouble at the time of the refraction.

The diagnosis is readily made by use of the placido disc or the square of Wecker, or by the shadow test, or the ophthalmometer. The patient will also naturally hold his head in the position where the rays of light will pass through the clearest part of the cornea, or where he gets the clearest image. If we wish to give the best vision in the direct line of vision, I have found that the stenopaic slit has given me the best results, placing the disc next to the eye and adjusting plus or minus glasses on the side of the disc away from the eye and changing the axis of the slit until best vision was obtained in any given axis, and then turning the slit to the next most prominent axis, as previously determined by the shadow or the ophthalmometer, and then adjusting plus or minus glasses and varying the axis as before until the best image was obtained in this position. Finally, using cylinders of the strengths previously obtained and varying their axes and strength until the best visual result was obtained.

The use of a pinhole diaphragm in the final test was useful in cutting off the rays of light not in the direct line of vision. In this way it has been possible to give glasses that were satisfactory and have been worn with comfort, whereas before no glass that had been ordered had given satisfaction or comfort. The following cases I wish to report:

April, 1909. Dr. T., dentist, aged thirty-three years.

Fs. 15 ft. O. S. + 5.00 D. cyl. ax. 20° — 4.00 D. cyl. ax. 90. 20-30 pt. 20-24.

May, 1910. G. L., aged twelve years.

Fs. 14 ft. O. D. + 5.00 D. cyl. ax. 105° — 3.00 D. cyl. ax. 180. 20-30.

Fs. 14 ft. O. S. + 4.50 D. cyl. ax. 165° — 9.00 D. cyl. ax. 90. ½ of 20-24. ½ 20-16.

November, 1911. F. F., housewife, now office assistant.

Fs. 5 ft. O. D. + 13.00 D. cyl. ax. 150° — 7.00 D. cyl. ax. 90. 20-30 —.

Fs. 5 ft. O. S. + 12.00 D. cyl. ax. 20° — 7.00 D. cyl. ax. 120. 20-30.

December, 1911. M. R., housewife, aged forty-five years.

Fs. 5 ft. — 5.00 D. cyl. ax. 75° — 8.00 D. cyl. ax. 165. 20-40.

O. S. — 5.00 D. cyl. ax. 75° — 8.00 D. cyl. ax. 180. 20-40.

B. G., aged twenty-three years, housewife.

20-40 — O. D. + 100 D. cyl. ax. 30° — 1.50 D. cyl. ax. 150. 20-30 pt. 20-24.

In none of these cases had a satisfactory glass ever been worn, although all had worn glasses previous to this test. I have had recent reports from four of these cases, and the correction is still comfortable. The fifth one never paid her bill and I have lost sight of her.

Stenopaic spectacles have been recommended in these cases, but owing to the very limited field which is possible with such a glass, their use must be very limited. The vision, when the cylinders were fitted at right angles, uniformly fell back from one to two lines on the test chart. Although the corneal curve may change, I believe that it is well worth while to order such corrections when vision is manifestly improved and the comfort of the patient is materially increased.

Discussion.—Dr. Green: I would like to mention something which Dr. Woodruff's paper reminds me of. It is not entirely apropos, but I had a patient in which there was a decided weakness of some of the muscles, and I tried to correct the weakness, the diplopia, with prisms, but I seemed to have difficulty in getting the prisms at the proper axis. The patient wore the prisms, but became fidgety; and she herself tried to improve on the position of the prisms. She really did accomplish it, the diplopia disappeared, and after repeated tests I was satisfied that such was the case and I prescribed the prisms in the position in which she had placed them; and she is still wearing them.

Dr. Luedde: Dr. Woodruff's report concerning the use of crossed cylinders has interested me because I have used crossed cylinders in selected cases for a number of years. However, not in the way that he has placed them, but always at right angles to each other. One case in particular, which I

recall at the present moment, was that of a young lady with a marked keratoconus in one eye. I was able in that case to get good binocular vision, but the determination of the cylinder was accomplished only by repeated trials, such as Dr. Woodruff has described in his cases. The optical value of crossed cylinders on neutralization of the lens is always equivalent to a combination of spherical and cylindric lenses. Crossed cylinders with axes not at right angles are also equal by exact neutralization to a simple compound of sphere and cylinder, but the axis of the cylinder to be combined with the sphere to give this same value will not correspond with either of the axes of the crossed cylinders. The greatest advantage that I have found by the use of crossed cylinders has been the possibility of exceeding the ordinary limit of a trial case by combinations of this kind. The trial case may have no cylinder greater than 6. or 8. D., but by using crossed cylinders an effect equal to 12. to 16. D. can be attained.

Meeting of November 5, 1913.

Vascular Keratitis of Eye.

Dr. J. Cross: This man, nineteen years old, came to the clinic at Washington University several days ago. As you will see, he had a vascular keratitis of the right eye, which covers almost the entire cornea, excepting an oval area surrounding the center. The entire cornea is vascularized so the iris cannot be seen, and the central portion of the cornea appears grayish and hazy. I could not get a satisfactory history of lues from him; says he had a sore on his genitalia about a year ago, and again three months ago. He does not give any history of secondary trouble, and there are not any secondary manifestations. The right eye became sore about seven weeks ago. Four days later he went to the City Hospital and remained there ten days. While there he was given salvarsan. The eye did not improve, and he left the hospital at the end of ten days. He then consulted an oculist and remained under his treatment five weeks, but he was not satisfied with his treatment. It seems that this oculist proposed enucleation, and that is a matter which I would like you to consider tonight—as to whether or not there is any reason why there should be an enucleation. The tension is a little

below normal. We have placed him on mixed treatment. Our diagnosis is luetic trouble, either acquired or congenital. I think it is quite an unusual case. We did not have a Wassermann made.

Discussion.—Dr. Woodruff: I would like to know if a tuberculin test has been made?

Dr. Green: Have there been any signs of sympathetic irritation?

Dr. Gross: No tuberculin test was made. I have not seen any signs of sympathetic irritation, and I cannot see on what grounds the oculist proposed enucleation.

Dr. Shoemaker: Was there any ophthalmoscopic examination made of the good eye?

Dr. Gross: No. I was quite anxious to have the section see the case, and did not have time to make an ophthalmoscopic examination, as the patient has so much photophobia.

Both Wassermann and tuberculin tests, made later, were negative, and examination of the fundus of the good eye showed nothing abnormal. Vision of right eye, perception of light; left eye, 20/38.

Reports and Presentation of the Glaucoma Cases Operated on by Col. Elliot, of India.

Dr. W. A. Shoemaker: What is Col. Elliot's opinion regarding the indications and the contraindications of his operation in simple chronic glaucoma, and what results has he obtained?

Dr. Green: I believe I can answer Dr. Shoemaker. That question came up and was one of the principal points in the discussion at Chattanooga. Dr. Reber read a paper on "Trephining in Glaucoma," and incidentally stated, in regard to chronic glaucoma, that he would not perform any operation so long as vision and fields did not diminish and tension did not go above normal. This view, which, I presume, is shared by most American surgeons, was strongly opposed by Col. Elliot. He compared chronic glaucoma to appendicitis: after one attack you are probably going to have another; in fact, you are always going to live in the expectation of repeated attacks. He believes that each case of chronic glaucoma ought to be operated on as soon as the disease is definitely recognized.

Dr. Shahan: I saw a case of Dr. Ewing's in which an

iridectomy had been accidentally performed in one eye, in the man's youth, many years before he came to the office. In the other eye he had glaucoma simplex, which caused that eye to become blind. I have always believed that the traumatic iridectomy in this case acted as a prophylactic and prevented the onset of glaucoma.

Dr. Wiener: Col. Elliot also made the remark that he thought the trephining operation should always be made in both eyes. Because he considered it a prophylactic measure, it should be done in the second eye, even if there were no symptoms.

Dr. Ewing: In this connection, Col. Elliot remarked that in India a large proportion of the cases showed only constriction in the visual field, cupping of the disc and visual failure, with very little elevation of the tension, yet he always resorted to the operation with favorable results.

Dr. Post: As we are quoting, I might also quote this, as it possibly throws a little light upon the opinion of so high an authority as Col. Elliot. He says that his patients in Madras frequently came long distances. So when they came with suspicious conditions, and as very likely it was their only opportunity, he felt obliged to operate where he would not if the man were his next-door neighbor and he could keep track of him. Of course, I take it that very few of us can feel that any operation is absolutely free from a certain amount of risk. I can say that Col. Elliot is very pronounced in his idea that if there is any suggestion of glaucoma, the eye should be trephined; and I think in his mind the glaucoma in one eye makes it probable that it will attack the other, and that it may be best to operate on the second eye as a prophylactic measure, where it is probably the only time in his life when the man can get the services of a competent ophthalmic surgeon.

Dr. Jennings: Unfortunately, I was not able to be present at Dr. Elliot's operations. As regards the question how soon are we to operate? It seems to me that the enthusiasts in this operation are inclined to operate at once. Recently I have had under my care an English lady, who developed glaucoma, and for two years I have kept the tension normal and the field the same by the use of eserine. About three months ago she started back to England, and I gave her instructions

and a letter to a London ophthalmologist, and I have just learned that she had hardly set foot in England before both eyes were operated upon. In all of the cases of this operation I reported last year, I always secured the conjunctival flap after the operation by several stitches. I think this is a wise plan and saves trouble. Yesterday a gentleman came to me who has been blind in both eyes for five years from glaucoma. A southern surgeon had done the Elliot operation—i. e., trephining at the limbus—but had made a trephine opening in the sclera 5 mm. back of the limbus, and the tension is now perfectly normal. It seems to me that this case is of interest as showing the mere opening into the sclera and covering it over with the conjunctiva is just as efficacious as if it had been done at the limbus.

Dr. Loeb: It seems to me there are two points in regard to Col. Elliot's operation that we must keep in mind. As far as the operation itself is concerned, it seems to be easy except for the splitting of the cornea. I believe any one who has had experience as an operator could do the operation. But I do not believe the length of time the operation has been in use is sufficient for us to make judgment as to the final outcome of these cases. We do not know how they are going to turn out five years from now. These holes may close up. There may be an increase in tension. In the second place, after all, the increase of intraocular tension is not the disease glaucoma. It may cause the bad results, the crushing out of the optic nerve fibers, and the excavation of the disc, but there is more to the disease than this. Because we can relieve the increase of tension is no reason why we should cease our efforts to determine its cause. Only after we have succeeded in combating the etiology of glaucoma will we be able to speak of its cure. As a symptomatic treatment, I believe the Elliot operation is one of the best, if not the best.

Dr. Charles: Perhaps the case I have to report will answer some of these questions. Dr. Jennings spoke of a case under his care for two years. The following concerns an eye almost normal for two years before an acute attack.

On July 26, 1905, Mrs. L. S. E., aged fifty-seven years, under my observation at that time fourteen years, telephoned for relief from a severe neuralgic pain over right eye with redness. She received cocain, grain one; adrenalin, grain one,

in two ounces of water. The next morning her tension was normal, and it was decided that she did not then have glaucoma. With correction, vision was normal, right and left. Except for correction of refraction and a rather frequent conjunctivitis, patient had been free from treatment most of the time until October, 1911, when the tonometer showed: O. D., 20 mm., and O. S., 26 mm., and her blood pressure varied from 140 to 118 mm. She was given pilocarpin for home use, with which complete miosis was obtained. Rainbow vision was noted at times. The pupil of the right eye was slightly larger than that of the left. Reactions all normal. O. S., 19/15. No special change until June, 1913, when tension was: O. D., 25; O. S., 23 mm., and the patient was complaining of neuralgia around the right eye. At no time did I see her in an attack. Her discs were slightly cupped. In my absence, September 3rd, Dr. Hardy sent her to St. Luke's with an acute attack of glaucoma. He used eserine freely in both eyes, gave the patient cascara and calcium chlorid, and upon my return, September 14th, her vision was: O. D., 19/19 +, and O. S., 19/15. Tension 23 mm. right and left. Fields only slightly contracted nasally; an unusually good result. She was operated upon by Col. Elliot, Saturday, October 26th. The operation was executed beautifully upon a well-behaved patient. Atropin was used every day for three days. The whole area is now edematous, the anterior chamber more shallow than formerly, and her refraction has changed so much from displacement of the lens forward, that with the old glasses her vision is only 19/60, while -1 sph. addition is required to reach her old acuity of 19/19. The patient is still too nervous to obtain an accurate result with the tonometer, but the intraocular pressure is perceptibly lower than that of the left eye, and very much lower than before operation. The coloboma is a scarcely perceptible slit, in marked contrast to the deformity seen after an iridectomy for glaucoma. In regard to the preparation of the nervous American patient, it seems to me that bichlorid 1-3000 in the eye, and scrubbing the conjunctival sac with the application are unnecessarily severe. I believe in the taking of smears and cultures beforehand, and appropriate preliminary treatment, as well as the use of thorough irrigation at the time of the operation. Also, I believe that it is a good plan to use

normal saline solution during the rather long operation, for the purpose of preventing desquamation of corneal epithelium. These are mere details, however, and not intended to be a criticism of the operation itself.

Dr. Green: I presume most of the members of the section will agree that the vigorous scrubbing of the conjunctiva, as practiced by Col. Elliot, is unnecessarily severe, at least for American patients. He acquiesced to my suggestion that this part of the preliminaries be dispensed with and contented himself with squeezing the Meibomian glands and douching the sac with 1-3000 bichlorid.

Dr. Charles: The main point about this patient of mine, as you noticed, was that it was visually almost a normal eye. It had been followed for two years since October, 1911, kept under control with pilocarpin at home, until she came to Dr. Hardy with acute glaucoma and a blind eye, and he brought it out of the attack with almost normal vision.

Dr. Post: Did Col. Elliot omit the scrubbing process entirely after that operation?

Dr. Green: Not in any that I witnessed.

Dr. Ewing: Here I wish to add that among the fifteen operations performed in my presence, the most quiet patients were four at St. Luke's Hospital, with whom a one per cent holocain solution was used in the eyes every ten minutes for half an hour preceding the cocain.

Dr. Charles: As to holocain, it seems to me that the use of a local anesthetic, far enough ahead to have it soak in thoroughly, is to have the patient comfortable and easy to handle without the toughening effect on the cornea by the too frequent use of cocain. Just before the operation I use cocain.

Dr. Green: It may be of interest to the members to know of one case that Col. Elliot operated for me, in which, after the removal of the button, there was no prolapse of the iris. In that case the Colonel did not make any attempt to do an iridectomy. He fears that damage may be done by an attempt to get out a peripheral scrap of the iris in those cases in which the iris fails to present.

Dr. Jennings: It seems to me that if the ideal section were made the iris would prolapse.

Dacryocystitis Caused by a Membranous Closure of the Nasal Duct.

Drs. Meyer Wiener and Wm. E. Sauer.—Dr. Wiener: The importance of insisting on a thorough and careful examination of the nasal end of the tear duct is emphasized by the cases here reported. I well know that the thought is ever uppermost with the majority of practicing ophthalmologists, of the existence of a close relationship between lacrimal obstructions and inflammation of the nasal mucous membrane, but I also believe, as the appended cases will show, that sufficient care is not always taken in determining the exact cause of obstruction of the tear duct.

Case 1.—Mrs. A. D., seventy years of age, native American, consulted me on October 19, 1905, for a mucocele of the right sac, which she stated had been present for more than a year. Previous to that, however, she had been troubled with tearing for a period of several years. She had consulted several ophthalmologists, had been subjected to numerous probings and washings of the sac, with little or no benefit having been derived. She insisted that she had no nasal catarrh, was not subject to colds, and demonstrated that she could easily breathe through either nostril. I washed out the sac, but was unable to force any fluid through the nose, the solution regurgitating through the upper punctum. A No. 6 Bowman probe was easily passed through the duct to the nose.

It was with difficulty that she was persuaded to have an examination of the nose made. The report showed, however, no abnormality of the nasal cavity. At the instance of Dr. Sauer, another examination was made at his office with the probe introduced into the nose. A membranous obstruction prevented the probe point from entering the nasal cavity, although it could be distinctly felt and seen through this thin membranous obstruction. On October 26th the obstruction was removed by Dr. Sauer, after which fluid readily passed through the nose and the mucocele permanently disappeared. This patient was last seen by me January 30, 1911, and was at that time free from any apparent trouble with the lacrimal apparatus.

Case 2.—Mrs. B. O., fifty years of age, native German, consulted me July 10, 1913, suffering with chronic dacryocystitis of the right sac. She had had many months of treatment by

various ophthalmologists, but had given up in despair, and had had no treatment for eighteen months previous to my examination. The last treatment had consisted of expressing the contents and the passing of Bowman probes. The physician had sent her to a rhinologist, but the report came to him that the nose was in perfect condition. I also experienced some difficulty in having another examination made in this case, but succeeded in persuading the patient to be examined with the introduced probe, which examination was made August 1, 1913. A No. 4 Bowman probe slipped easily down into the nose. Examination of the nose showed that here also the free exit of the probe was prevented by the presence of a thin membrane covering the opening of the duct; this obstruction was slit on August 14th, after which time the pus from the sac drained through the nose. This opening soon closed, however, necessitating an excision of the membrane about four weeks later. The patient has been free from accumulation of pus in the sac and also from excessive tearing for the last month.

I wish to lay particular stress upon the importance of the nasal examination being made with the probe being introduced. This can be done by the ophthalmologist himself, or by the nose specialist, if he is practiced in the art. And there are some who are quite proficient.

In a search through the literature, de Schweinitz is the only authority that I have been able to find who describes a similar condition, and he emphasizes the necessity of exposing the lower entrance of the nasal duct into the inferior meatus by means of the nasal speculum, after the probe has been introduced.

Dr. Sauer: As stated by Dr. Wiener, a pathologic condition of the lacrimal canal may exist at its nasal orifice which cannot be detected by the ordinary methods of rhinoscopic examination. The opening of the duct is high up under the inferior turbinate, and can be seen only with a Holmes pharyngoscope, or when a part of the turbinate is removed. It is, therefore, necessary to pass a Bowman probe from above in order to locate the point of obstruction. In the cases reported by Dr. Wiener this was done. A part of the inferior turbinate was removed. The end of the probe was then located in a pouch of mucous membrane. The movements of the probe

within the sac could be seen through the nose. The sac was then removed and the probe passed readily into the nose. A few probings were required to maintain this opening.

At various times attempts have been made to probe the nasal duct from its nasal orifice. La Forrest made the first attempt in 1730, but, owing to the short distance between the opening of the duct and the floor of the nose, only a small portion of the canal could be reached. This method had been given up until Polyak resurrected it in 1902. He had a number of probes constructed, with which he claimed to be able to dilate the lower portion of the canal, and reports three cases in which he succeeded in curing the epiphora. As far as I was able to learn, no one adopted his method. Caldwell made the first attempt to open the nasal duct through the nose in 1893.

In 1901 Passow described an operation in which, after introducing a Bowman probe from the lower punctum as far as possible, he introduced a punch forceps in the nose and removed the anterior end of the turbinate as well as the nasal wall of the lacrimal duct, until he reached the probe. He reports a number of successful cases. Eight years ago, Hyman, of Berlin, advocated fracturing and turning up the inferior turbinate in those cases where the obstruction was due to a turning outward and upward of the lower margin on the turbinate, especially in roomy nasal passages. When the passages were narrow, he removed a part of the lower turbinate as well. Since Passow described his first operation, a number of rhinologists have devised various methods for securing a permanent opening of the canal. West, Polyak and Halle have each devised an operation for opening the duct and sac through the nose: the principle involved is the same in all three, the difference being a slight variation in the technic. After incising the mucous membrane just in front of the insertion of the middle turbinate, making either a curved or rectangular incision, the mucous membrane is then elevated and the flap turned up out of the way. The nasal wall of the lacrimal duct is then chiseled away until the sac is reached, being careful not to injure the membranous canal. The membrane is then incised up as far as the sac, when the nasal wall of the sac is removed as in Toti's operation. Halle and West replace the flap of mucous membrane, leaving a free communication

between the lacrimal sac and nose; Polyak removes this flap. West has done this operation in one hundred and thirty cases, and claims to have been successful in ninety per cent. In some of the cases an external operation had been performed, and in these cases the results were not satisfactory; Polyak had operated upon thirty-one cases with satisfactory results.

In December, 1911, Yankauer described an operation in which he makes a horizontal incision one-fourth inch in length, just in front of and above the anterior end of the middle turbinate. This incision is then carried down to the anterior end of the inferior turbinate, when it is carried backward along the lower margin of the inferior turbinates for one-half inch or more; the mucous membrane is then elevated and the flap turned up. The mucous membrane below the inferior turbinate is also dissected away from the turbinate, leaving the bony portion of the turbinate exposed; this portion of the turbinate is then removed with a pair of forceps as far back as the opening of the lacrimal canal, the canal is then opened with a suitable forceps. The nasal wall of the entire bony canal is removed, after which an incision is made in the membranous canal as far up as the sac; this incision is made along the posterior wall of the canal and the flap is turned forward. The nasal wall of the lacrimal sac is removed with a pair of forceps, after which the mucous membrane of the nose is stitched back in place. The nose is packed for twenty-four hours, at the end of which time the pack is removed and the canal is irrigated from the upper punctum with a normal salt solution. This is kept up for several days. He has operated upon nine cases, with satisfactory results in eight.

In 1911 von Eichen devised an operation in which he opened the canal from the maxillary sinus. After opening the canal he removed a portion of the sac; since that time he has modified his operation by entering the canal from the canine fossa, without opening the antrum; his operation is done under cocaine anesthesia, and he claims that the operation is easier and a better view of the work is obtained than when working intranasally.

Discussion.—Dr. Luedde: I would like to report a case of this type. A man came to my office with the swelling usual in lacrimal obstruction. He said there had been no pain, but that this swelling had been there more than four months.

When I injected borax solution into the lower punctum it passed freely into the nose. I then passed a Bowman probe to the nose without obstruction, yet the swelling remained. I could move the mass in front of the probe, but could not rupture it by moderate pressure. I then passed a sharp probe as far as mass, brought the tip forward in the lacrimal fossa, and stuck it into the mass. There was a gush of blood—stained watery fluid—and the man was “cured.” The swelling did not recur, though under observation for months. The patient believed this swelling was brought on by his habit of blowing his nose severely. It evidently was a simple membranous sac. A careful nasal examination in this case failed to reveal anything abnormal.

Dr. Wiener, in closing: The point I wanted to bring out, and which I hoped the members of the section would appreciate, was the fact that the nose was seemingly practically normal in these cases. Now, you have all had cases which have been sent to nose specialists which they have examined and found pronounced involvement of the inferior turbinate, or a bulging of the septum, or involvement of the lower part of the nose. In one case, I do not recall now the name, but Dr. Sauer had passed upon that case as a normal nose. The patient had been sent to Dr. Alt, and Dr. Alt had sent her to Dr. Sauer some years ago, and Dr. Sauer had said the nose was normal. Of course I know Dr. Alt is not to blame; he did his part to ascertain the cause. And then later this same patient came to me. We had had some experience in the meantime, and Dr. Sauer then passed the probe and found this membranous obstruction. You could see the thing move behind the membrane. I could not get a bit of fluid through, and that was the point I wanted to bring out—that every examination of the nose for an obstruction of the nasal duct should be made with a probe previously introduced. De Schweinitz mentions the fact that very often we have a little membranous fold obstructing the opening of the duct, although he did not mention complete membranous obstruction.

PHILADELPHIA POLYCLINIC OPHTHALMIC SOCIETY.

Meeting of November 13, 1913.

SYMPOSIUM ON GLAUCOMA.

Pathogenesis of Glaucoma.

Dr. William Zentmayer: The factors in intraocular tension are the fluids of the eye, the nerves controlling the secretion of these fluids, the channels of excretion, the perivascular and the tissue lymph spaces. The fluids are the blood, the aqueous, and the vitreous. The channels of excretion are the spaces of Fontana, the ligamentum pectinatum, Schlemm's canal, the lymph spaces at the pole of the eye, and the veins. Notwithstanding so many factors entering into it, the intraocular tension remains fairly constant under variations in these factors. So that increase in the secretion of the fluids cannot be considered an important factor in glaucoma. The ciliary body and the anterior surface of the iris are concerned in the secretion of the aqueous. The results of pathologic changes in these structures and experimental study has made this quite certain. Changes may occur in the chemical composition of the aqueous and vitreous which retard filtration. Changes occur in the angle of the anterior chamber and also in the other channels of excretion which hinder the outflow. Some of these are enlargement of the lens with age, and sclerosis of the vessels and of the sclerotic coat. Inflammation of the sympathetic nerve may be a factor in the production of glaucoma, as irritation of the nerve produces many of the symptoms which accompany glaucoma; the division of the nerve produces the opposite conditions. Certain etiologic factors contribute to the pathogenesis of glaucoma: age, in the production of sclerosis of the tissues and enlargement of the lens; hyperopia, in its association with smallness of the cornea and relatively too large lens, also in its resulting hypertrophy of the ciliary body from excessive accommodative act; grief and shock, in dilating the pupil and altering the secretion.

Dr. Zentmayer then spoke of certain theories put forward to explain glaucoma, which are based upon facts which should be considered in the production of increased tension. Such are those of Fricker and Gilbert, in which the cardiovascular and vasomotor systems are considered prime factors; that of Fischer, who ascribes it to a swelling of the colloidal substances in the eye, due to absorption of water; and, lastly, to the recent work of Stronkowsky, who places the entire trouble in the sclera. Aside from the senile changes which contribute to simple glaucoma, he assumes the existence of an indurative scleritis, which may be general or limited to the anterior or posterior segment. There is no increase in the tension in simple glaucoma, but there is a reduction in the size of the globe, with a reduction in the size of the scleral opening and an extension of the inflammation to the lamina (part of the sclera) which increases its bulk. These two factors cause the lamina to become cupped. The conditions induced by scleritis favor the production of acute glaucoma.

Use of Myotics in the Treatment of Simple Glaucoma.

In the absence of Dr. Posey, who was to speak on the use of myotics in the treatment of simple glaucoma, the following views were set forth:

In the presence of chronic, simple, noninflammatory glaucoma, as determined by the vision, the tension with the tonometer, the ophthalmoscopic picture and the visual fields, myotic treatment at times preserves useful vision for many years. By this is meant sufficient strength in the myotic to keep the pupils well contracted. From time to time it will become necessary to increase the strength of the myotic solution. The custom is to employ pilocarpin during the day, from one-half to five grains to the ounce, and eserine at bed time, from one-half to three grains to the ounce. These solutions should be frequently prepared, filtered and dispensed in amber or blue bottles at least once in two weeks. Great care should be taken to wash the dropper after each instillation, for impure or contaminated solutions are likely to set up a conjunctivitis necessitating the withdrawal of the myotic solution for a time.

In this way vision of 5 15 and over has been preserved to

many patients, most of them elderly people, for from ten to fifteen years. Naturally the best results are obtained from this method in private practice, where full cooperation is secured. In dispensary patients operations would, therefore, be generally indicated, as also in young adults, between twenty and forty years of age, with chronic noninflammatory glaucoma.

Dr. Zentmayer and Dr. Reber agreed that this substantially represented Dr. Posey's views as to the value of myotics and the treatment of noninflammatory glaucoma.

The Operative Treatment of Glaucoma.

Dr. Wendell Reber: In the present day operative treatment of glaucoma you have your choice of the classic iridectomy of von Graefe, of an anterior sclerotomy, a posterior sclerotomy, or one of the newer filtration operations, such as the Herbert, the Heine (cyclodialysis), Lagrange's or Elliot's.

The arguments for iridectomy are: Ease and quickness of performance (in skillful hands), rapid healing, lessened liability to infection, usually freedom from complications in the healing, and fifty years' record of good results in the majority of cases.

The arguments against iridectomy are: The difficulty of the corneal section in the presence of a very shallow anterior chamber, the large extent of the incision (in some cases as much as 8 to 10 mm. in length), the danger of dislocation of the lens following sudden escape of the aqueous, the likelihood of presentation of the lens in the wound, and vitreous escape. These three factors all favor hemorrhage in the vitreous because of the sudden release of the support which the intra-ocular vessels had enjoyed up to the time the eye was opened. The greatest argument against iridectomy, however, obtains in the chronic, noninflammatory glaucoma, in which the percentage of cures and improvements after iridectomy is not large enough to justify a conscientious surgeon in urging the operation upon a patient. It was for this latter class of cases, in which the vascular coat of the eye is notably degenerative, that sclerotomy was first proposed. It also was found insufficient because of too rapid closure of the lips of the two wounds. Herbert, therefore, after making his puncture and

counterpuncture, as in ordinary sclerotomy, revolved his narrow Graefe knife in his fingers, thus making a jagged wound at the point of puncture and counterpuncture. To this he added a conjunctival bridge, and later modified it as his "isolation wedge operation." With the same idea in view, Lagrange began his incision like an anterior sclerotomy, and carrying his knife up and through the sclera and conjunctiva, made a small scleral flap which was then turned forward. He then boldly cut off a piece of the sclera. To Lagrange will everlastingly belong the credit of being the first man with the courage to thus deliberately cut out a piece of the sclera.

Unfortunately, Lagrange's operation also creates a large opening in the cornea, and it was while mulling these things over in his mind that Elliot conceived the idea of trephining a small opening in the sclera at the uppermost portion of the angle of the anterior chamber. To me it seems that this is the best filtration operation thus far devised. It not only permanently reduces tension, but does so without endangering the lens and without favoring hemorrhage in the vitreous, as does Lagrange's operation, or the classic iridectomy of von Graefe. It is not quite as easily or as quickly performed as iridectomy, but it should be done on an ordinary patient in from ten to fifteen minutes.

Moreover, in the vast majority of cases, it can be done under local anesthesia, and this is no small matter. It is easier of accomplishment under local anesthesia if a preliminary hypodermic injection of morphin $\frac{1}{4}$ grain and atropin $\frac{1}{150}$ grain has been employed. At first I employed it for the relief of pain in sightless eyes with absolute glaucoma, which it was formerly taught should be enucleated. Later I employed it in chronic simple glaucoma, and was so much pleased with the results that I have also resorted to it in acute inflammatory glaucoma. I am now of the conviction that it is equally applicable to any and all forms and phases of glaucoma.

Up to date I have done twenty-seven Elliot operations. In two there occurred choroidal hemorrhages, but both of these were the subject of absolute glaucoma, and I have the satisfaction of feeling that I did not have to do with the disastrous consequences that attend expulsive choroidal hemorrhages after iridectomy.

As to technic, I agree with Dr. McReynolds, of Dallas,

Texas, in the use of the wedge-shaped, small, sharp-cutting instrument for separating the conjunctival layer of the cornea when the limbus has been reached. This procedure ought to shorten the operation by at least five minutes, and, in my opinion, will insure tapping of the anterior chamber in the vast majority of cases.

Finally, I feel that Elliot's operation for glaucoma is the safest one in the hands of the operator of small experience, and if this be true, it ought to logically follow that it is easily the safest operation in the hands of the skilled surgeon. Those who by years of experience are absolutely committed to iridectomy as the sheet anchor of treatment in glaucoma, point to fifty years of results from this measure. I am far from denying the great boon which iridectomy has been to humanity, but I am strongly of the opinion that twenty-five years hence the trephining operation for glaucoma will have absolutely justified itself.

Dr. William M. Sweet drew attention to the acute cases of glaucoma that come on in the middle of the night, and in many of which there are premonitory symptoms before retiring, such as pain and discomfort in and about the eyes, accompanied with the halo phenomenon. It was his feeling that an iridectomy under general anesthesia with the keratome was the procedure of election at this time in this class of cases. If the case could be seen after the very acute stage had passed, he would rather favor trephining. He also alluded to glaucoma seen after cataract operation, and graphically pictured the differential diagnosis.

Patients with chronic simple glaucoma generally appear in ophthalmologists' offices with one eye pretty badly used up as to vision and the other with beginning failure of vision. He would favor the miotic treatment of these cases tentatively, bearing in mind all the time that they may develop acute congestive glaucoma at any moment. In his judgment it would be poor surgical judgment to operate on both eyes at the same time. He would prefer to operate on one eye and wait at least an hour or two before operating on the other. In this way any tendency to disastrous choroidal hemorrhage could be watched and properly met. He spoke at some length of the filtration cicatrix and observed trenchantly that he was not at all alarmed by the presence of iris in the wound so long as it was covered with conjunctiva.

Discussion.—Dr. Zentmayer: I have often stated my position as to the indications for the employment of miotics and operations in the treatment of simple glaucoma, and have nothing to add to it at this time. As to the trephining operation, I do not see how we can pass final judgment on an operation so recently perfected, when employed in the treatment of a disease with so chronic a course as simple glaucoma. I doubt not that at the end of a similar period of time after the introduction of iridectomy it stood as well as does trephining today.

I do not think anything is lost by using strong miotics, frequently repeated, for a period of forty-eight hours before performing iridectomy in acute glaucoma. The best time to operate is in the prodromal stage, before the occurrence of the first congestive attack.

Cyclodialysis is a useful substitute for enucleation in absolute glaucoma, and it is the operation of choice in glaucoma secondary to thrombosis of the central vein or marked angiosclerosis. The slow reduction of the tension after the operation is its valuable feature in these conditions.

Meeting of December 11, 1913.

The Etiology of Uveitis.

Dr. William Zentmayer spoke of changes in recent years in the relative frequency and causes of uveitis. Some years ago the vast majority of cases were placed as syphilitic, and most of the remaining rheumatic. Today the latter as a cause is scarcely recognized, partly because of the restricted sense, rheumatic fever, in which the term is now used. The other affections in which arthritis is a symptom have mostly been traced to a different origin.

He gave a resume of the exhaustive survey of the subject by de Schweinitz at the International Congress last August. The extreme vascularity of the choroid makes it prone to inflammation, especially endogenous processes. Due to the persistence of Michel, tuberculosis is now recognized as a frequent cause of choroiditis as well as inflammation of the anterior part of the uvea. Syphilis is the cause in at least 60 per cent of both iritis and choroiditis.

Not all clinicians are prepared to eliminate rheumatism as

a cause. As you well know, Krüekmann has described a fibrinous type as characteristic of rheumatic and gonococcal toxemia. Gout, which at one time was considered a frequent factor, is now considered by some to cause iritis only indirectly by its general toxic action. Gonococcal uveitis is a well-recognized entity, and besides the particular type assigned to it by Krüekmann, it produces a keratoiritis in which minute vesicles form on the cornea, and in which the inflammation is of a quiet type. Foci of staphylococci elsewhere in the body are now rightly considered the etiologic factor in the small number of cases of uveitis complicating arthritis.

Since Elschnig's first communication on uveitis resulting from autotoxemia, there has arisen a considerable literature on the subject, some of which opposes his views. De Schweinitz's conclusions, based upon the results of elaborate metabolic examinations in a series of cases of different forms of choroiditis and chronic uveitis, are, partly: "Inasmuch as intestinal putrefaction certainly depends upon the activity of bacteria upon the foodstuffs in the intestines, there seems good reason to believe that these bacteria or their toxic products may be the cause of an inflammation of the uveal tract, exactly as bacteria from other foci of suppuration have a similar influence. In this sense, therefore, gastrointestinal intoxications have a right to be included among the etiologic factors of uveitis."

Malaria, diabetes and nephritis are undoubtedly occasional causes of inflammation of some part or other of the uveal tract.

The Treatment of Choroiditis.

Dr. Wendell Reber spoke of the advance that has been made in the therapeutics of choroiditis in the last twenty years. In the early 90's, most patients with choroiditis were promptly placed upon inunctions and iodids, and it was seldom that anything else was done for them. With improved laboratory methods it was found that certain forms of low grade choroiditis associated with uveitis were at times associated with gastrointestinal toxemias.

The laboratory diagnosis of syphilis has also helped us to a more intelligent therapeutics. The various tuberculin tests have enabled us to differentiate the now well-recognized tubercular choroiditis, and a question now being raised is whether

choroiditis and uveitis are ever related to intranasal and accessory sinus disease. Because of the overwhelming preponderance of syphilis as an etiologic factor, salvarsan and neo-salvarsan have come into vogue as potent remedial agents in this form of the disease, but there is now question as to their value in such inflammations.

In the tubercular forms of choroiditis the treatment of tuberculosis proper is naturally in order, and in the auto-toxic forms the best possible elimination naturally forms the basis of the treatment. In recent years the subconjunctival injections of normal saline solution and of weak oxycyanid of mercury solution have been highly commended. We have ourselves seen the most brilliant results from this method of treatment, and we have a distinct feeling that it might well be added to the internal treatment in subacute and chronic choroidal lesions.

Retinochoroiditis Juxta-Papillaris.

Dr. Leighton F. Appleman reported a case of what Edmund Jensen named retinochoroiditis juxtapapillaris—a localized inflammation involving the retina and choroid immediately beyond the disc, and occurring in young healthy adults without history of lues or other dyscrasia.

The case consulted him because of slight blurring of vision, pain in the left eye and near the inner canthus, which had appeared three days previously. The blurring had increased. Vision $5/6$ in each eye, increased in the right eye to $5/3$ with S. $+ 0.25 \text{ } \ominus + .25$ cyl. axis 90, and the left to $5/4$ with S. $+ 0.25 \text{ } \ominus + 0.50$ cyl. axis 90. Ophthalmoscopic examination showed clear media, disc swollen $+ 3$ D, edges obscured. The swelling, white at its thickest part, just off the disc, extended above and to the temporal side, gradually blending with the normal retina in the neighborhood of the macula. The vessels were hidden by the swelling, the veins engorged and tortuous. Slightly above the macula were four small, parallel, radially disposed hemorrhages. There was an absolute scotoma involving the area of the blind spot and extending over a portion of the nasal field. At the present time it involved practically the whole nasal field. One week after he was first seen vision was reduced to $5/21$ in the affected eye; probably due to the vitreous opacities which appeared about this time. Treatment

consisted of hot compresses locally and 1 per cent atropin solution. Sweating by means of hot packs daily, followed by inunctions of mercurial ointment to the point of salivation, and later the administration of potassium iodid. By these measures the inflammatory condition and vision began to improve. At the present time he shows an area of degeneration near the disc, up and out, with some pigment heaping, involving an area about half the size of the disc, although there has been but little choroidal absorption. The disc edges are now fairly distinct, the vitreous opacities have disappeared, and his visual acuity is $\frac{5}{6}$ without correction. The visual field is of prime importance in deciding whether the diagnosis is a neuroretinitis or an exudative choroiditis in juxtaposition to the nerve head. The most important and most constant change in neuroretinitis being a concentric contraction of the visual field, enlargement of the blind spot and formation of scotomas; whereas, in localized choroiditis the visual fields will show a scotoma corresponding to the portion of the fundus involved, the course of the inflammation being relatively benign, with practically no loss of central vision, unless the macula be involved in the process.

Jensen believed the loss in the peripheral field to be due to a thrombosis of the arteries as a result of the exudate, and consequently the area supplied was deprived of perception.

Gross Peterson, who last year reported a series of fifteen cases, attributes the visual defect to a destruction of the nerve fibers produced by the inflammatory focus. This seems to be the most plausible explanation.

Disease of the accessory nasal sinuses and the possibility of a toxin must be considered among the causes.

References.—Edmund Jensen, *Arch f. Ophthl.*, August, 1908. Gross Peterson, *Klin. Monatsbl. f. Augen.*, August, 1912. Abstract from *Ophthalmology*, April, 1913.

Meeting of January 8, 1914.

The Use of Hot and Cold Applications in Ophthalmic Practice.

Dr. Luther C. Peter, in summing up the indications for the use of hot and cold applications in ophthalmic practice, pointed out that cold is a depressant; it retards the circulation, delays cell activity, is analgesic, and to some extent, bactericidal.

Heat is a stimulant, it quickens the circulation, renders cell life more active, is a sedative, and in high temperature is analgesic and of some bactericidal value.

As to the method of application:—Water furnishes the ideal medium through which heat and cold may be applied. Textbooks refer to their application in the form of coils, the Japanese "hot-box," hot-water bag, electricity, etc. There are few if any conditions, however, which do not admit of moist heat, and the student of ophthalmology will do well to restrict applications to water.

Discussion.—Dr. Wm. Zentmayer said that he had hoped to hear from Dr. Peter how much the temperature of the conjunctival cul-de-sac can be altered by the application of compresses to the lid.

Dr. Peter explained the relief from pain obtained from the use of cold compresses to the analgesic effect of the cold on the peripheral nerve filaments. While this may be the true explanation, he was of the opinion that it was more likely to be due to the relief of the congestion. While the moist heat fulfills the requirements best in inflammatory conditions, the application of dry heat by means of the Japanese box serves better when you wish to keep up the vitality of a graft. It maintains for a long time a steady slight elevation of temperature. Dry heat is occasionally found more soothing than moist in iritis. An application of cold water, which is said to be as efficient as it is heroic, is the dousing of the head in cold water to relieve the intense blepharospasm met with in phlyctenular disease of childhood. In indolent central corneal ulcer of childhood, in which the pupil fails to dilate under atropin, stimulation of the ulcer and absorption of the cycloplegic can be secured by holding the pipette containing the solution over a lamp until it begins to boil and then dropping the solution upon the ulcer.

Dr. Appleman called attention to a point mentioned by Dr. Peter, namely, of slightly warming the drops before using. It is not enough to give a prescription and tell the patient to wash the eye or drop the medicine into the eye at stated intervals. They should be told to warm the solution before using, as even at room temperature, a drop of solution allowed to fall on the eye from a short distance above it feels very uncomfortable, the more so if the solution has been chilled in

cold weather in the journey home or from the drug store. The patients should be told how to hold the head, how to open the lids, whether to use an eyecup or a dropper for collyria; especially in treating children should the parents be told in minute detail how to carry on the treatment at home.

Care in these minute details tends to create the impression in the minds of patients that the physician is careful, interested in and alive to overcoming the difficulties of the case.

Dr. Reber said that the question as to whether hot or cold applications are to be used in a given case has always been a matter of great contention. The general principles underlying the use of both heat and cold have been most beautifully laid down by Dr. Peter, but, as usual, there are exceptions. For instance, most authorities prefer the use of cold applications in the early stages of conjunctivitis and inflammatory lid troubles, and hot applications in all other external diseases. In iritic disturbances it is the almost invariable rule to use hot applications, and yet there is an occasional case that seems to get more relief from cold applications. Similarly, here and there will be found an authoritative worker who prefers almost constant hot applications in ophthalmia neonatorum, notably, Dr. Myles Standish, of Boston.

In all traumatisms about the eye I am devoted to ice with atropin and argyrol combined with a course of calomel internally. I believe that if this were generally laid down as the proper treatment in all traumata many eyes would be saved. I think we are also apt to overlook the fact that any surgical operation is also a trauma. That in extensive intra-ocular operations this very same treatment should be of great value. Dr. Zentmayer's suggestion of a drop of almost boiling hot atropin solution directly upon the corneal ulcer appeals to me strongly, and I shall use it at the first opportunity. Hot normal saline solution in a very fine stream has been used by some one as a curette for corneal ulcers. I have forgotten just who it was, but I can endorse it as a most efficient method.

Interstitial Keratitis.

Dr. Leighton F. Appleman said that interstitial keratitis occurs most frequently between the ages of five and twenty years; in the majority of instances as a result of hereditary syphilis; according to some observers, in from 60 to 80 per

cent of the cases. Acquired syphilis is considered the cause in from 2 to 10 per cent, and next to syphilis, tuberculosis in about 10 per cent of the cases. Still others are ascribed to various diseases in which abnormal nutritional changes are manifestly predominant.

In most cases the sight is so seriously impaired that the patient can barely count fingers, or, in others see the movements of the hand before the eye. As a rule both eyes are not affected at the same time, although the second eye is ultimately involved; it may be after an interval of several weeks, months or years. Of this the patient should be warned.

The treatment for this condition is first local, which consists in the use of atropin to maintain mydriasis. After the local irritation has subsided, and when absorption is going on, the process may be hastened by one of the following means: First, by the use of dionin in 5 or 10 per cent solution, instilled two or three times a day, which acts by increasing the lymphatic activity; second, by the use of subconjunctival injections of from five to ten minims of normal saline solution, repeating them after the resulting irritation has disappeared; third, by the use of mercurial oxid ointment, applied or introduced into the cul-de-sac and followed by massage of the cornea through the closed lids. Salvarsan is also used by some in cases of syphilitic origin, with gratifying results.

Discussion.—Dr. Zentmayer said that in the prognosis of interstitial keratitis we must not forget that disseminated choroiditis is very often associated with the corneal condition. In fact, there is usually associated a uveitis. While suppuration is very rare in interstitial keratitis, the cornea sometimes undergoes softening with a resulting staphyloma. I believe that in salvarsan we have made a distinct advance in the treatment of this condition. Improvement seldom follows the first injection, but several are necessary. It always relieves the subjective symptoms and usually improves the objective ones. The disease in the second commonly runs a milder course than that in the first eye affected. I believe that more than 90 per cent are due to syphilis.

Dr. Reber warned against the slowness with which results are achieved in interstitial keratitis. Twenty years ago it was pretty generally conceded that interstitial keratitis was almost invariably of syphilitic origin, but since the advent of

the modern laboratory methods we can make more accurate diagnoses. Many more cases of tubercular interstitial keratitis are reported. I have had two in my own practice within the last year. One must also bear in mind the type of interstitial keratitis that is lighted up by a traumatism. This generally occurs in people in whom the syphilitic taint is latent. Salvarsan and neosalvarsan are of less service in interstitial keratitis than in almost any other form of ocular inflammation. In interstitial keratitis repeated injections are necessary, sometimes six, eight, or even ten being required. It is a nice question whether inunctions won't produce quite as good results as promptly. No matter how prompt and vigorous the treatment, however, the second eye is almost invariably involved.

W. WALTER WATSON,
Secretary.

WILLS HOSPITAL OPHTHALMIC SOCIETY.

Meeting of Monday, November 3, 1913. Dr. S. Lewis Ziegler, Chairman.

Vertical Diplopia Following the Killian Operation.

Dr. J. Norman Risley presented a patient who had been one of three illustrative cases of diplopia following the Killian operation, which formed the subject of a paper read before the Philadelphia Laryngological Society by Dr. Skillern at its December, 1912, meeting.

The patient first applied for relief to Dr. Risley in August, 1912, for a vertical diplopia which incapacitated her from all lucrative occupation. The diplopia had appeared immediately after the first removal of the bandage, following a Killian operation performed by Dr. Skillern, July 23, 1912.

At no time had there been any real relief from the double vision, and the amount of deviation was steadily increasing. When first seen, after correcting a simple hypermetropic astigmatism, there was a left hyperphoria of 8° and an esophoria of 3° . This was corrected by suitable prisms, but under frequent observation the hyperphoria steadily increased until in October, 1913, $20\frac{1}{2}^{\circ}$ was demonstrated for infinity by ruby light and maddox rod, but no lateral deviation.

The patient, however, had never been able to return to her work as a loom operator, even with the prismatic correction, owing to distortion of images and fear of injury. It was suggested that a tenotomy of the left superior rectus might possibly be beneficial. On October 2, 1913, a free tenotomy of the left superior rectus was made. The eyes were kept bandaged for more than a week without measurement of any sort being taken, in order not to interfere with firm reattachment of the tendon in its new position. At the end of that time rod and light showed absolute orthophoria, which has continued to date, November 3, 1913.

Discussion.—Dr. Zentmayer recalled having seen a case of paralysis of the superior oblique, probably due to detachment of the pulley by a penetrating orbital wound. It had been impressed on his memory because the correct diagnosis had

been made by the country doctor who had referred the case to the clinic. His recollection was that Dr. Norris entirely relieved the diplopia by cutting the inferior rectus of the opposite eye.

Case of Melanosarcoma.

Dr. Berens: Mrs. Anna Trout, aged forty-eight years, Coatesville, Pennsylvania, was assigned to my service at Wills Hospital on October 11, 1913. The patient declared herself as "never being ill," and her appearance certainly confirmed her words; but protruding from between the eyelids of the left side was a mass of black and foul tissue two and three-fourths inches horizontal diameter, one and three-fourths inches vertical diameter, and extending two inches beyond the eyelids. The mass moved concomitantly with the sound eye and seemed pedunculated. There was a history of injury to the eye fifteen years ago. The pedicle was strangulated by a stout silk suture and severed with scissors. The lids and orbital tissues were found unaffected, and the posterior half of the globe was removed without difficulty. Healing was prompt. Microscopically, absolutely no involvement of the inner layers of the globe were found. The iris, lens and ciliary bodies were seemingly free from disease, and the mass seemed to have grown entirely from the cornea and was not pedunculated.

Dr. Berens also reported a case of congenital double upward dislocation of the lens.

Dislocated Lenses.

Dr. Frank Fisher reported the following history:

F. C. C., aged thirty-one years, on June 3, 1907, appearance of eyes normal save slightly tremulous irides. Right eye, lens dislocated up and in, showing opaque edge crossing the pupil at about the lower third. Vision, 2/60. Left eye, lens dislocated up and out, the opaque edge crossing the pupil at lower third. Vision, 2/60.

H. M. C., aged six years (son of F. C. C.), on September 21, 1910, appearance of eyes was normal save for slight epicanthus. Irides not tremulous. Right eye, lens dislocated up and in, the opaque lower border crossing the pupil at extreme lower edge. Vision, 5/60. Left eye, lens dislocated up and

out, the opaque lower border crossing pupil at extreme lower edge. Vision, 5/60.

A history of the refraction of these cases may be interesting. The father had for years worn concave lenses, about -16 , affording distant vision of 5/60, but no satisfactory vision for near objects. Under mydriasis the right eye, with $+11.00 \supset +1.00$ cy. ax. 120° , yielded 6/9. The left eye, with $+11.00$, yielded 6/12. These lenses were ordered and mydriasis continued for some weeks. When mydriatic was discontinued the eyes had adjusted themselves to a position permitting vision below the dislocated crystalline lenses. Plus three was added for near work. Vision has remained the same up to this time.

In the son's case the vision had to be adjusted through the crystalline lenses. Right eye, $-2.00 \supset -2.00$ cy. ax. $180^\circ = 6/20$; left eye, -1.50 cy. ax. $150^\circ = 6/9$, which vision is maintained till this time.

Dr. Schwenk stated that a dislocated lens is a foreign body in an eye, and sooner or later it gives rise to glaucoma or iridocyclitis, and should be removed before the eye is thus destroyed while there is still hope for useful vision. He reported two cases, brother and sister, each having lost one eye from glaucoma, but the remaining eye in each case was made useful by having had the lens removed. Discission in the young and lens extraction in adults should be done as soon as the patient will assent. Dr. Schwenk had had uniform good results in half a dozen or more cases.

Dr. Posey said that he had under his care at the present time a case of bilateral symmetrical upward and inward dislocation of both crystalline lenses. He was attempting to remove the lens of the right eye by discission. On account of the difficulty and danger often present in the removal of dislocated lenses, he thought operative procedure should only be undertaken when vision was greatly compromised in consequence of the faulty position of the lens. A point of considerable importance, to which attention is but seldom called, is the age at which operations upon the lens should be undertaken in children. All things being equal, Dr. Posey thought it desirable to delay operating until the child was at least three years old. The dressing of the wound is difficult in young infants, making the chance of infection greater. In

cases of total cataract he had operated as early as two or three months.

Delayed Formation of the Anterior Chamber After Cataract Operation.

Dr. Zentmayer presented two cases of delayed formation of the anterior chamber after cataract operation. Both patients were operated upon the same day, about six weeks ago. In one the chamber has been formed one week, and in the other it is still absent. The first patient was a man seventy-one years of age, in good health. The operation was without complication. There was marked striped keratitis from the beginning; this was followed by dense haze of the central and upper part of the cornea, which has gradually cleared since the reformation of the chamber, about one week ago. One week after the operation the lips of the wound were wiped and touched with a twenty grain solution of nitrate of silver. All bandages were removed and the lids kept closed with isinglass strips. There was no further interference. Vision today is 6/15.

The second patient was a man seventy years of age, mentally and physically weak. The lens was removed with a vectis, and some vitreous was lost. The anterior chamber was reformed after forty-eight hours, but was empty twenty-four hours later, and has remained so. The cornea is clear, the iris is against Descemet's membrane and is becoming atrophic. There has been marked ciliary congestion, and the tension recently has been elevated. Vision equals hand movements. The treatment was precisely that of the first case.

Dr. Zentmayer said that there are many causes for failure of the wound to close early, the most frequent being the presence between the lips of the wound of a shred of capsule or cortical; slow healing of the wound, from either local or systemic conditions of impaired nutrition; uneven pressure from bad bandaging. He thought the explanation in the second case might be that the adhesion of the conjunctival flap had allowed the aqueous to reform, and this explained the formation of the chamber at the end of forty-eight hours. That after that the vitreous came forward and occupied the space formerly making up the anterior and posterior chambers. This supposition is upheld by the fact that the tension is increased, which would not be so if the wound were leaking.

Discussion.—Dr. Posey asked Dr. Zentmayer if he had thought that the shallowness of the chamber might be due to an escape of the vitreous into the suprachoroidal space, due to rents in the periphery of the iris—i. e., an example of the class of cases to which Fuchs has called attention. He could remember two such cases in his own practice. Dr. Posey thought the solution of rapid restoration of the anterior chamber after cataract operation resides in the acquisition of an ample, properly placed conjunctival flap. Before he had become a convert to this method of extraction he had had several cases of delayed union, in one the flap showing no tendency to heal, even six weeks after the extraction. In this case union was finally accomplished by cauterizing the lips of the wound with the actual cautery.

Dr. Zentmayer said, in reply to Dr. Posey, that he had failed to consider this as a cause, but thought that if that was the explanation the tension should be normal.

Absolute Glaucoma

Dr. Schwenk showed a case of absolute glaucoma on which he had the senior house surgeon do an Elliot operation with the view of lessening the glaucomatous tension and pain. The case progressed nicely, but the tension not abating, as we had anticipated, we decided to remove a cataractous lens. The anterior chamber being very shallow, the knife was passed through the lens in making the incision. After the incision was completed the lens popped out, somewhat embarrassing the operator. The eye was dressed within limits of safety and bandage applied. Two days later patient was out of bed without a bandage, and the eye looked as though it had not been operated upon. The anterior chamber was established, the wound united, and the patient anxious to go home. Dr. Schwenk considered the Elliot operation useful in old glaucoma cases, but in acute cases he preferred iridectomy.

Discussion.—Dr. Posey said that he did not consider the trephining operation the simple procedure many claimed. It took but a cursory glance through recent articles of Elliot and Walis to learn of its serious complications. Indeed, it is surprising what a variety of happenings may attend removal of such a small piece of sclera. Dr. Posey said the chief difficulty he had to contend with was to obtain a sufficiently sharp cut-

ting edge on the trephines. He did not find it necessary to insert a stitch into the conjunctiva. One should get along with as little adrenalin as possible, on account of the swelling of the conjunctiva which it entailed, thereby somewhat obscuring the limbus. He was still skeptical whether the results of trephining would be found to compare with those obtained from the proper use of miotics. Careful and detailed observations of groups of cases studied for a number of years after operation would alone decide.

Dr. McCluney Radcliffe spoke of his favorable experience with the Elliot operation, and commended it as a safe, conservative and efficient operation. He prefers the von Hippel trephine, as it cuts quickly and without undue pressure on the globe.

Unusual Opacities of the Crystalline Lens.

Dr. Burton Chance exhibited from Dr. Schwenk's clinic two cases showing unusual opacities of the crystalline lenses occurring in a man and a woman. The man had lost an arm by being crushed by heavy machinery. He came to the hospital because of a solder burn of the conjunctiva. The woman could not remember having received injuries, nor could she otherwise ascribe any cause for her impaired vision. The man stated that he had been a sharpshooter in the United States army, and had passed tests while in the service. The visual acuity of his left eye was normal; of the right, only 6/60. Excentrically in the posterior cortex was an almost exactly circular ring of opacity forming a dense line. Radiating about it, as from the more superficial layers, were fine striæ made up of small dots. The anterior cortex contained fine striations also. The deeper media and fundus were healthy. In the woman's left eye the lens presented practically similar characteristics. In the two cases the portions included by the rings contained no opacities; a clear reflex passing through them.

The exact etiology of these cases is hard to state. Assuming that the man's lens was injured at the time of his accident, one might presume and believe that the woman's eye, too, had been injured by an accident, the knowledge of which had entirely passed from her recollection.

Bilateral Congenital Cataract.

Dr. Chance also presented a case of bilateral congenital cataract in a colored girl of seven years, who had been referred to the city ophthalmologist by her school teacher, with the belief that she had only weak sight and could be benefited by glasses. In each eye the lens was opaque to within about the outer sixth. The opacities consisted of large discs composed of converging clumps which in no way resembled stars, as the base of the pyramids were peripheral. Between the slanting sides of the clumps the lenses were sufficiently transparent to afford a visual acuity equal to 6/12. No satisfactory views of the funduses could be obtained, yet the choroids and retinas were believed to be healthy.

Meeting of Monday, January 5, 1914. Dr. S. Lewis Ziegler, Chairman.

Simple Glaucoma

Dr. S. D. Risley presented a case of simple glaucoma which had caused blindness of the right eye. The eye then became painful from an attack of acute inflammatory glaucoma which had been relieved by a trephining operation done by a colleague in Philadelphia. She came under Dr. Risley's care because of failure of sight in the left eye with marked contraction of the field of vision and tension 44. He had done a peripheral iridectomy and presented her with normal tension. He called attention to a fine circle of pigment spots on the anterior capsule of the lens only seen in the coloboma, proving that what had appeared at first sight to be a simple glaucoma was, after all, a case secondary to general uveal disease. There had been no iris bombé. He thought she illustrated a group of so-called simple or noninflammatory glaucomas which were, nevertheless, associated with low forms of uveal disease.

Discussion.—Dr. Zentmayer: I should like to ask what has been the effect of the trephining operation on the other eye? As some time has developed since the operation, it would be of value to know. In a case of this kind I should expect that it has had but little effect. It seems to me that iridectomy is the operation of choice.

Syphilitic Iritis.

Dr. S. D. Risley also presented a case convalescing from a violent attack of syphilitic iritis, which had come to the clinic with a large nodule on the iris and with marked plastic adhesions to the anterior capsule. The man had rapidly recovered under the use of mercurial inunctions, the eye when shown being nearly white. He was brought to demonstrate the presence of two white dots in the membrane of Descemet, circular in form and not more than one-half millimeter in diameter. These dots had appeared only within the last forty-eight hours. Dr. Risley did not remember to have seen such a deposit in the presence of any form of uveal disease.

Mules' Operation.

Dr. S. D. Risley exhibited a patient upon whom the Mules' operation had been performed a week before. He urged the necessity of not removing the bandage after this operation for at least forty-eight hours, since if removed earlier the lids suddenly become puffy and the conjunctiva edematous, a condition which does not occur in the majority of cases, if a firm bandage is allowed to remain.

Discussion.—Dr. Ziegler emphasized the need of maintaining pressure on the socket, both in enucleation and in implantation, in order to prevent edematous infiltration into Tenon's capsule, which is so liable to stiffen the eye muscles and later cause poor socket movement. To illustrate this he exhibited a case of implantation of a gold ball, in which each muscle had been caught up separately by a suture and all tied together. The bundle of threads were allowed to lie loose on the lower lid for purposes of drainage and easy removal. Elastic pressure was then made by three reef sponges and a pad of gauze, covered by a tight bandage. This dressing was removed daily and elastic pressure continued for four days. The sutures will be removed at the end of a week or ten days. The eye was injured by a toy air gun carrying a BB shot which perforated the globe, entering the ciliary body and passing out through the sclera behind. The X-ray showed the bullet resting near the optic nerve, where it was found when the eye was removed. Already the socket has good movement.

Tubercular Keratitis.

Dr. S. D. Risley showed three cases of chronic corneal disease, each of which had been under treatment for long periods of time at various clinics, resulting in temporary improvement, but followed by rapidly recurring exacerbations. There were nests of deposit in the cornea, little gray areas, one or two millimeters in diameter, over the membrane of Descemet. Phlyctenules along the margin of the cornea in each case, and in one the cornea was vascular. The von Pirquet test proved positive in every case, and they were all making a speedy recovery from the ocular disease and showing great improvement in their general health under the injections of old tuberculin. The doses had been steadily increased from 1/500 of a milligram up to 1/250 or higher; the object being to avoid any local reaction. In each case the dread of light had disappeared, the appetite had improved with a gain in weight. The third case was an example of uveal disease. The submaxillary glands were enlarged; there was ciliary injection, but study of the fundus was impossible, owing to the deep infiltration of the vitreous. She had a pernicious appetite, but no demonstrable pulmonary lesion. The von Pirquet test proved positive, and she received, as in the other cases, the slowly ascending doses of old tuberculin. Her general health had greatly improved, the vitreous infiltrate was steadily absorbing, a very much blurred image of the fundus could be made out, and there was a corresponding improvement in her vision.

Dr. Risley said that he believed that this patient furnished an illustration of the fact that many of these cases of obscure uveal diseases were the result of unrecognized tuberculosis. In all of the cases shown, the injections of tuberculin were administered three times weekly.

Discussion.—Dr. C. J. Kistler said that the history of Dr. Risley's case of phlyctenular keratitis had interested him very much, on account of the experience he was passing through at that time. The patient was a young girl, who also had enlargement of the submaxillary and cervical glands; she never had any symptoms of pulmonary tuberculosis. A von Pirquet test was made, and the response was very violent, as though she had been vaccinated for smallpox. Her arm was quite inflamed, showing red streaks of lymphangitis. Since

that time, instead of getting better, her eyes had been very bad. She was a telephone operator, but stopped work because she could not bear the lights of the board. The question arose as to what to do in such a case—to let her go until the reaction had subsided, or to use the tuberculin injections while in this condition.

Dr. Brinkerhoff said that in Dr. Risley's cases of tubercular keratitis the initial dose administered of Koch's old tuberculin was 0.05 mg., which was gradually increased to 0.02 mg. He said that in the case of Helen, when the dose reached 0.02 mg. there was reaction; the patient having fever, headache and malaise. The dose was decreased; the symptoms then subsided, and her eye condition had since that time rapidly increased. He also said that he rarely had an extreme reaction with the von Pirquet, and that there was generally a hyperemia around the site of the tuberculin injection which rapidly disappeared in a few days. He said that in Dr. Kistler's case the scarification had probably become infected.

Dr. Kistler said that as for an infection, he did not think there was a mixed infection at or outside the vicinity of inoculation with tuberculin, because he had done a great many von Pirquets and would have recognized this. There was usually no trouble and but little redness and swelling. This case was entirely different. He was always careful, after doing an ordinary von Pirquet, to cover up the points of test, and had never had any mixed infection; this would be the first, and he felt quite positive the intense reaction was not due to a mixed infection.

Two Cases of Injury From the Impact of a Small Bullet Projected From an Air Gun.

Dr. Risley reported two cases of injury from the impact of a small bullet projected from an air gun, in which the blow had apparently been received upon the closed eyelid. In one instance the vitreous was found filled with exudate so that no study of the fundus could be made. The ball was transilluminable in all parts of the field except below. After the absorption of the exudate under rest in bed, cold compresses and atropin, a large rupture of the choroid was found at the posterior pole, between the macula and nerve, concentric with the nerve border. In the second case there were three rup-

tures. When seen both cases had had a hemorrhage in the anterior chamber. These cases were brought forward to illustrate the fact that though these missiles from a child's toy air gun are small, they may, nevertheless, produce grave injuries to the eye.

Case of Symblepharon of the Uper Lid Following a Burn.

Dr. Ziegler exhibited a case of symblepharon of the upper lid following a burn on which a Berens operation had yielded a moderate result, but contraction again occurred. He then did an extensive conjunctivoplasty, removing the tissues from the cornea and freeing the globe above. This flap was turned back toward the retrotarsal fold and sutured through the upper lid. A double armed suture was then buried in the sclera near the upper limbus, brought out through the lower lid, and tied through a pearl lid plate, thus drawing the cornea far down and putting the severed tissues on a stretch. The conjunctiva on each side of the open wound was then dissected loose and bridged across the scleral gap. Already there is good movement of the globe, the upper cul-de-sac normal in appearance, and the cornea is perfectly free. The silk sutures buried in the upper and lower lids were passed through pearl buttons placed on the skin surface and tied with bow knots, to either readjust for swelling or reef in the slack as the edema disappeared.

Incised Wound of the Eyeball.

Dr. Sweet exhibited a boy, aged twelve years, who had an incised wound of the eyeball, about eight millimeters in length, which extended through the cornea and sclera in the lower portion of the globe. The injury was caused by a large piece of glass falling from above, which cut the cornea and iris obliquely, leaving a large, gaping wound. The character and extent of the injury seemed to point to enucleation as the ultimate result, but as the lens did not appear to be injured, it was decided to endeavor to save the eye, and a Kalt suture was inserted, drawing the wound edges in apposition, and over this was drawn a large conjunctival flap. The conjunctival tissue remained firmly in position, and all injection has subsided. Vision with a low myopic correction equals

20/30. The results of the treatment in this case emphasize the value of suturing of the cornea and the employment of the conjunctival flaps to cover large wounds of the globe.

Congenital Lamellar Cataract

Dr. Sweet also showed a boy, aged six years, with congenital lamellar cataract of unusual form, exactly similar in appearance in each eye, although discission had been performed in the right eye. The periphery of the lens was clear, but the nuclear portion showed a faint dark ring, only clearly shown by oblique illumination, and in the center of the disc-like area was a dense brilliant white three-point star, from the middle of which extended forward to near the anterior capsule a white tubular opacity.

An elder brother was in the hospital at the same time, with a similar but larger binocular lamellar cataract, but without the central polar opacity. Some years previously a sister was operated upon for lamellar cataract in each eye. The mother had normal lenses, but the father had had poor eyes, the exact nature of which is not known. He had never had an operation upon the eyes.

J. MILTON GRISCOM.
Secretary.

BOOK REVIEWS.

The American Encyclopedia and Dictionary of Ophthalmology.

Vol. I, A to Azoviolett. Edited by CASEY A. WOOD. Published by The Cleveland Press, Chicago, Ill., 1913.

In reviewing this attempt to present the science of ophthalmology in an easily accessible form, one is prejudiced in its favor as soon as he notes the names of the editor and his collaborators. Many of them are "household words" in ophthalmology, and all of them are more or less familiar to the readers of ophthalmic literature. This favorable impression becomes more fixed the more one examines the result of their labors. The first volume comprises an introduction, a list of collaborators and over 700 pages of text printed on rather heavy paper in very legible type. It is to be regretted that the publishers did not adopt the thin so-called India paper, as the work in its present form is rather bulky. In addition to the English titles and their Latin equivalents, foreign words and their meanings are given in their correct alphabetical order. For instance, a whole range of choroidal affections are defined under the German name of Ader and its different combinations. There are numerous cross references and duplications, the latter to avoid a search through other volumes, "for which much thanks." There are numerous illustrations, especially of the subjects dealing with the various operations and of the anatomy of the eye. The reviewer would criticise the use of feet instead of meters in expressing the acuteness of vision. In selecting subjects for commendation the task is not so easy. However, we would direct attention to the historical portions, to drugs used in the eye, to the ocular symptoms of diseases of other organs, and other subjects such as After-cataract, After-treatment of Ophthalmic Operations, Alphabet and Literature for the Blind, the various forms of Amblyopia, Anesthesia in Ophthalmic Surgery, Arc Lights and Their Effect on the Eye, and Artificial Eyes and Similar Devices.

C. L.

The American Encyclopedia and Dictionary of Ophthalmology.

Vol. II, B to Cataract Incipient. Edited by CASEY A. WOOD.

Published by The Cleveland Press, Chicago, Ill., 1913.

The second volume of this series contains pages 729 to 1505, inclusive, and deals with subjects from B to Cataract Incipient. Worthy of special note in this volume are the following subjects: Bacteriology of the Eye, Basedow's Disease, and various topics dealing with the Binocular Relationship of the Eyes, Eyes of Birds, Blepharitis, Blepharoplasty, various articles dealing with Blindness, Brain Tumors, Ocular Symptoms of Bright's Disease and Cataract. There are numerous biographic sketches and articles dealing with therapeutics of the eye. All articles are discussed in detail, except certain ones where references to more complete discussion elsewhere are given.

C. L.

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XII.

PARENCHYMATOUS KERATITIS.*

ADOLF ALT, M. D.,

ST. LOUIS.

Parenchymatous keratitis is an essentially luetic affection, since in about 90 per cent of the cases lues can be demonstrated. It occurs in the vast majority of cases in childhood and early youth. In rare cases only we have occasion to see it in adults with acquired lues, the disease being almost always due to hereditary lues. In these cases, as a rule, it attacks both eyes. This happens, however, but rarely simultaneously. The interval between the affection of the two eyes may be only a few weeks or some months, but it may also amount to a year and more. It seems that the longest interval thus far observed was nearly two years.

A quite remarkable fact is that the second eye may, or rather will, become affected, although the patient is perfectly under the influence of the treatment. This is of practical value, since by the laity, and sometimes by physicians, the oculist is accused of not having done his duty by the patient when the second eye is attacked. I have, therefore, always made it a rule to inform the parents that this was to be expected.

In rare cases in which we see it in the adult the parenchy-

*Read in a Symposium on Ocular Syphilis, before the St. Louis Medical Society, November 22, 1913.

matous keratitis is usually due to acquired lues. In these cases it seems to be most frequently confined to one eye. Such a one sided parenchymatous keratitis is probably always preceded by a trauma of the affected eye. It has, therefore, not only been the subject of interesting discussion, but is also of forensic importance.

While about 90 per cent of the cases seen in the young are undoubtedly due to hereditary lues, there is a well founded suspicion that the remaining 10 per cent also are induced by the specific virus, although it may be associated with that of tuberculosis.

Parenchymatous keratitis from hereditary lues attacks the individuals usually between the ages of six and fifteen. It is rarely seen earlier. Sometimes, however, it makes its appearance much later in life, even up to thirty years and more. One of the cases I show you this evening was thirty-one years old when parenchymatous keratitis made its appearance. It is thus one of the latest manifestations of the hereditary luetic taint.

It is quite natural that the chance for the histologic study of this disease is but rarely offered. From the examinations thus far made we know, however, that the infiltration and inflammatory process concern chiefly the deeper layers of the cornea. The fixed corneal cells become edematous and are destroyed, and from the corneal periphery leucocytes wander into the interlamellar lymph spaces. Here they form smaller and larger accumulations, in the neighborhood of which the corneal tissue proper is also destroyed. Into the ensuing detritus the corneal cells of the neighborhood proliferate. This process is followed by the new formation of blood vessels, which, coming chiefly from the deeper corneal marginal blood vessels, grow towards the inflamed part and gradually reach the seat of densest infiltration together with some newly formed connective tissue. Finally the cells diminish in numbers, and a connective tissue similar to that of the cornea, but with a very irregular arrangement of its lamellæ, replaces the loss. Then the blood vessels become atrophied and disappear in the main, although some small branches usually remain persistent.

While these changes occur in the corneal parenchyma the epithelium is also affected. Its cells show signs of edema and

PARENCHYMATOUS KERATITIS.

degeneration and are pervaded by leucocytes, although Bowman's membrane is intact. The inflammatory process can be traced back into the sclerotic, the iris and ciliary body, and the anterior part of the choroid. The *treponema pallidum* has been found in parenchymatous keratitis by Igersheimer and a number of other investigators.

The clinical picture which corresponds to these histologic findings is a somewhat variegated one.

Before detailing it I may mention that the very aspect of the patient, as a rule, is characteristic of the congenital taint. Such patients are pale and sickly in appearance; their faces have a senile expression; there are scars at the angles of the mouth; the lymph glands of the neck are swollen and hard; the nose may be sunken in; in fact, all of the well known symptoms which help to make the diagnosis of hereditary lues may be present. Hutchinson's teeth are hardly ever wanting. Even in such rare cases in which the general appearance of the patient is such that one would hardly suspect him to be the subject of the hereditary taint, the teeth usually show the true condition. In the few cases in which no other signs of hereditary lues can be detected than the affection of the cornea, the Wassermann test may give a definite diagnosis.

As said, the clinical aspect of parenchymatous keratitis varies considerably. In the most common form there is some slight localized ciliary injection, the corneal surface has lost its luster in a part, or in its whole extent. There is a triangular opacity with the base in the periphery, or there are one or more roundish opacities in other parts of the cornea which soon coalesce. These opacities are of a dull gray, grayish blue, or whitish yellow or white appearance, according to the amount of cell infiltration, and lie in the deeper layers of the cornea. In most cases, however, the opacity or opacities begin to form at or near the corneoscleral margin, and gradually move towards the center of the cornea and beyond it. It may happen that in the part first attacked the cornea clears up while the opacity creeps on to the opposite corneoscleral margin, where it gradually also disappears. In some cases the opacity starts in the center of the cornea, and may even remain comparatively stationary, forming a gray central disc; in others it forms a more or less complete ring concentrically with and somewhat removed from the corneoscleral margin.

so that it is quite similar to an arcus senilis. Yet in most cases, wherever the opacity started, at some period it covers the whole of the cornea or at least so much of it that the patient is virtually blind for some time.

After this stage has been reached, or even before, the opacity begins to clear up. This clearing up is usually preceded by the new formation of blood vessels, which are seen to grow in the depth of the tissue from the marginal blood vessels of the cornea into the opaque area. There is, however, no uniformity in this process. While in some cases it is impossible to recognize the new formed vessels with the naked eye, they are in other cases so numerous and densely packed that the opaque cornea takes on a tint which has not inappropriately been likened to the color of salmon. In rare cases it is impossible to trace any blood vessel formation whatever, and these seem to be the most obstinate ones.

The clearing up process usually begins at the corneoscleral margin, so that it may happen that at a certain time a ring of clear cornea surrounds a central more or less disc-like opacity, and that the patient with a dilated pupil has fair vision, when without this he can barely find his way. It has been stated that such a condition shows that the parenchymatous keratitis is healing, while, when the densest opacity lies at the corneal margin, it shows that the disease is still progressing. This, however, is not always true. The cases in which many new blood vessels are formed are, as a rule, the more favorable ones. The cases in which no new blood vessel formation can be seen are, as a rule, the most obstinate ones.

Ulcer formation is very rare in parenchymatous keratitis. Small corneal abscesses combined with a small amount of hypopyon I have seen a number of times.

The iris is in most cases inflamed, and the pupil, therefore, must be kept dilated.

As stated before, the inflammation may spread backwards into the sclerotic and render this membrane less resistant. In such cases we observe usually also an increase in the intra-ocular pressure, accompanied with pain. From this a stretching of the sclerotic may result, as it did in the case of the young lady I showed you. Hers was one of the severest cases of parenchymatous keratitis I have seen. Before the attack

she was slightly hypermetropic. When the storm was over she had, besides a corneal astigmatism, a myopia of 2.5 diopeters.

In the common cases patients very rarely complain of pain, the only symptom, besides the reduced vision, being a more or less severe photophobia.

In some cases a diminished intraocular tension points to a cyclitis and choroiditis.

Even under good management the disease always lasts several months, and it may even take several years to get well. In the case of the young man I presented to you it has lasted over four years, to my personal knowledge.

Fortunately, under careful management the cornea very often gets—if not perfectly normal—at least so clear that the casual observer cannot notice any blemish, and the patient's vision becomes finally, if not altogether, at least almost normal. Yet even in the cases with so fortunate an ending we may with a magnifying glass still be able to see small blood vessels and some slight opaque spots years after the attack.

In other cases, some more or less dense opacity remains behind, which no treatment seems to succeed in clearing up. Since such opacities seem to lie most frequently in the center of the cornea, vision is, of course, considerably reduced. If the case has not been properly managed, posterior synechie and deeper lesions, even phthisis of the eyeball, may be observed. Relapses occur only occasionally.

The clinical picture of parenchymatous keratitis, though varying, is so characteristic that it seems hardly possible to confound it with other forms of keratitis. Its localization in the depth of the corneal tissue, the lack of ulceration, and the particular new formation of blood vessels, combined with the symptoms of lues, especially hereditary lues, assure a prompt diagnosis almost in every case.

In doubtful cases a Wassermann test may clear the doubt. It is well to keep in mind, however, that the patient may be suffering from both lues and tuberculosis, and that it may be of importance, especially in obstinate cases, to have also a tuberculin test made.

Since there will be another paper offered tonight dealing with the treatment of luetic affections of the eye, I just want

to add here that parenchymatous keratitis must be treated by general and local means. Mercury and iodids internally, mercurial inunctions or injections act beneficially; salvarsan seems in no way superior to them, perhaps not quite as effective. In the local management, massage with a mercurial ointment, instillations of atropin or, in rare cases, of eserin, dionin, and hot applications, play the chief role.

XIII.

A CASE OF PAPILLARY IRITIS FOLLOWING AN INJECTION OF SALVARSAN.*

CLARENCE LOEB, M. D.,

ST. LOUIS.

Perhaps no remedy was ever received with greater hopes than was salvarsan. The first reports were so favorable, the results so marvelous, and the untoward symptoms so few and insignificant, that it was believed by even the most conservative that at last a remedy had been found which was perfectly safe, and which would promptly cure syphilis. But by and by isolated reports of failures appeared, and these were followed by reports of local exacerbations following the use of salvarsan. Especially was this true in the eye, and reports of cases of optic neuritis began to be quite frequent. So much so, that a counter current of opinion set in, and ophthalmologists especially began to utter grave warnings against the use of salvarsan. It is still a question whether the salvarsan acts directly on the nerve, as a toxic agent, or indirectly by liberating more spirochetes which attack the nerve. Inasmuch as arsenic is not known to cause an optic neuritis, and since a second injection of salvarsan frequently cures the lesion, it seems to me that the latter view is the correct one. Especially am I confirmed in this belief since I have seen a lesion following the use of salvarsan which under no circumstances could be considered as caused by the salvarsan per se, viz., an attack of papillary iritis.

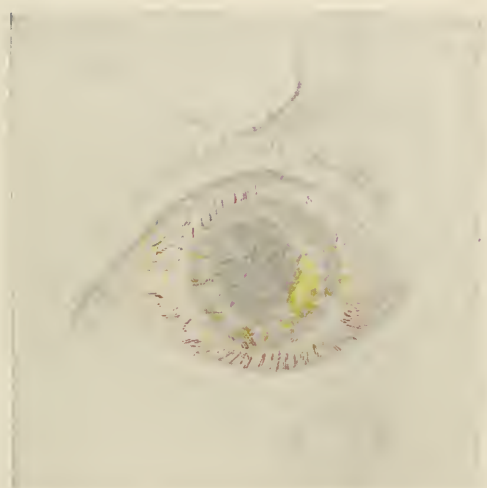
When we consider the frequency with which syphilis is the cause of iritis—from 50 to 75 per cent of all cases—the rarity of papillary iritis is the more striking. During my whole practice I have seen only three cases, whereas the cases of syphilitic iritis have been very many. In the last five years

*Read in a Symposium on Ocular Syphilis, before the St. Louis Medical Society, November 22, 1913.

less than a dozen cases have been reported, as shown by a review of the *Index Medicus* for that period. So I think I am justified in reporting this case, especially as it is only the second case I have been able to find which followed an injection of salvarsan.

On August 16, 1913, Miss G. N. came to me with the following history: Five days ago went in swimming. The next morning she noticed an injection and pain in the left eye. She was treated at one of the clinics, without much improvement. When seen by me there was an intense circumcorneal injection, photophobia and great pain. The pupil was slightly and irregularly dilated, being bound down to the lens by posterior adhesions. The iris was of a muddy color and showed about a dozen small reddish elevations in a circular arrangement around the margin of the pupil. Near the temporal margin of the pupil, starting a little above the horizontal meridian and running somewhat obliquely downwards and nasally, was a large very red elevation about 6 mm. long and 2 mm. broad. The surrounding stroma was more swollen than the remaining portions of the iris, and the adhesion at this place was firmer. In the anterior chamber, extending forward from the inferior margin of the pupil, was a gelatinous mass which was accompanied by a small hypopyon. The cornea was clear.

The patient gave the history of a luetic infection one year ago, which was treated by mercury at that time, and by an injection of salvarsan in April of this year. Under treatment with atropin locally and bichlorid of mercury and potassium iodid internally, the condition at once began to improve. The pain disappeared in a couple of days; the reddish elevations and the hypopyon grew less and less, and finally disappeared. On August 26th the pupil was well dilated, except at the site of the tumor, where an adhesion still persisted. The iris was still somewhat discolored, and there was still some circumcorneal injection. The accompanying drawing, made on that day, shows the condition quite well. There is a yellowish irregular elevation, on whose surface are red streaks indicating the course of blood vessels. The further history of the case was uneventful. The mass rapidly melted away, and by the next day no blood vessels were visible and the tumor had decreased fully a fourth. By the end of the week only the faintest trace of an elevation was to be seen, and in a couple



Papillary Iritis

of days only the adhesion remained to mark the site of the lesion and the fact of the disease. All pain and injection had long since disappeared. The patient was discharged cured. She has returned several times for examination, and except for a slight irregularity of the pupil, the eyes look alike. She is still taking bichlorid of mercury and potassium iodid. The last time I saw her was about three weeks ago. At that time the eye showed a very slight irregularity of the pupil, and an area of atrophy of the iris at the former site of the lesion.

In this case we have the history of an infection one year previously, treated for a short time with mercury and followed by an injection of salvarsan. In spite of this, four months later a typical case of iritis gummosa developed, for no reason except possibly the slight traumatic effect on the eye of swimming. It is hardly probable that the salvarsan itself had anything to do with the process, but it is certainly interesting to know that it was incapable of preventing the development of the iritis gummosa.

In both of my other cases there was the same history of pain, photophobia, circumcorneal injection, and the presence of a small reddish tumor of the iris. Both cases denied lues, and in one the Wassermann was negative. However, this woman's husband had been treated by another physician for lues. The other woman had had a miscarriage four years before the ocular lesion, and had had no children since. It is an interesting fact, whether it possesses any etiologic significance or not, that all three patients were women.

The only other case I have been able to find in the literature is that of Dr. Aaron Brav.¹ Although he calls his case one of "gumma of the iris," I think it is rather a gummatous iritis, since it occurred only five months after the initial lesion, and the symptoms as described are those of papillary iritis. The lesion occurred six weeks after the injection of salvarsan, and without any apparent cause, resembling my case, which also had no known exciting factor, but occurred about four months after the injection of salvarsan.

In contrast to these two cases, it is interesting to note that de Schweinitz and Shumway² reported a case of iritis papulosa which disappeared rapidly after a single injection of 606. It is possible that the dosage in my case was insufficient, and that a second injection would have caused the lesion to dis-

appear, but I preferred to use the bichlorid of mercury and potassium iodid, which had proved so successful in my previous cases.

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XIV.

PARALYSIS OF THE OCULAR MUSCLES.*

J. F. SHOEMAKER, M. D.,

ST. LOUIS.

In discussing the muscles of the eye, we generally divide them into the orbital, or extraocular muscles, and the intraocular muscles. The extraocular muscles are the external rectus, the internal rectus, the superior rectus, the inferior rectus, the superior oblique, the inferior oblique, and the levator palpebræ superioris. The intraocular muscles are the ciliary muscle and the sphincter of the iris. All of these, except the external rectus and the superior oblique, are innervated by the oculomotor, or third cranial, nerve. The external rectus is innervated by the abducens, or sixth nerve, and the superior oblique by the trochlearis, or fourth nerve.

Of all the causes of paralysis of both the extra- and intraocular muscles, syphilis occupies first place, conservative writers stating that it is responsible for about fifty per cent. When we add to this the large percentage of cases that are due to tabes, general paralysis, etc., diseases that are now recognized to be essentially syphilis of the nervous system, we see how large a part syphilis really does play in the etiology of ocular paralysis.

Rightly understood, ocular palsies become sign boards along the pathway by which we arrive at a certain diagnosis of many conditions, and hence are of vital interest to every physician. To illustrate this statement your attention may be directed to the importance of the pupil in the study of nervous diseases.

Paralysis of the extraocular muscles, whether caused by syphilis or by any other condition, presents certain symptoms, some or all of which are present in each case. The most important of these is diplopia, or double vision. Indeed, this

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condition is responsible for most of the prominent subjective symptoms. It is brought about by the fact that the affected eye fails to keep pace with its fellow, lagging behind, especially as the eye turns in the direction of the action of the affected muscle. Naturally the farther the eyes are carried into the field of action of the affected muscle, the more marked is the diplopia and the farther separated are the images, while when the eyes are turned away from the direction of action of the paralyzed muscle, the diplopia diminishes or may even disappear altogether.

False projection, vertigo and tilting of the head are other subjective symptoms of ocular paralysis. When an object is looked at by the affected eye, false projection is caused by the fact that the paralyzed muscle, in attempting to move the eye into position for fixing the object, has to exert an excessive amount of nerve energy, such an amount as under normal conditions would move the eye much farther. This produces an impression of seeing the object in the position where it would be seen if that amount of energy were used when the eye is in normal condition. A very distressing symptom, and one of the earliest often noticed by the patient, is vertigo, which is caused by the changing diplopia, objects seen by the paralyzed eye apparently moving. Tilting of the head takes place in many cases, in order to lessen or overcome the diplopia, the head being turned in the direction of the action of the paralyzed muscle. The constant tilting of the head thus may produce torticollis in some instances.

The diagnosis of paralysis of one or more of the extra-ocular muscles is made by noting the presence of (1) the deviation of the eye in the primary position; (2) the limitation of movement of the eye; (3) the lagging of one eye behind the other; and (4) the diplopia. The latter symptom is especially valuable in determining which muscle is paralyzed, as the diplopia is different with each muscle that is affected.

Of the three ocular nerves, the oculomotor, or third cranial, nerve is most frequently affected by syphilis. Indeed, paralysis of this nerve is usually caused by syphilis. Edward L. Keyes, Jr., says: "Paralysis of the third cranial nerve is almost the hallmark of cerebral syphilis, so common and so characteristic is it whether occurring alone or in connection with other and graver lesions." Complete paralysis of this nerve is readily

recognized, as the symptoms are most characteristic. The upper eyelid droops in complete ptosis, the patient trying to lift it by the action of the frontalis. The eye cannot be moved except outward by the action of the external rectus, and slightly downward by the superior oblique, and is generally drawn strongly toward the outer canthus. The pupil is widely dilated by the unopposed action of the sympathetic, and does not react to light or accommodation. Unless the eye is strongly myopic, distinct near vision is impossible, owing to the loss of accommodation caused by the paralysis of the ciliary muscle. There is crossed diplopia. Where the paralysis is incomplete, any one or more of the muscles controlled by this nerve may be paralyzed without the others being affected, in which case the diagnosis is not so readily made. The sixth nerve is frequently affected in tabes as well as directly by syphilis, causing a paralysis or paresis of the external rectus, thus allowing the eye to turn inward, producing homonymous diplopia. It seems to be the opinion of many writers that the external rectus is the muscle most frequently affected in tabes, although any one of the other muscles may be paralyzed in this disease.

The lesion producing ocular paralysis may be central or peripheral. The peripheral lesions of syphilis producing ocular paralysis are rather infrequent, although we may have a syphilitic myositis, a primary tabetic degeneration, or more frequently the presence of gummata in the orbit, producing such paralysis.

Central paralysis may be divided into basal (including foraminal), nuclear, and cortical. By basal paralysis we mean one due to a lesion of the nerve trunk after it emerges from the brain at its base and before it enters the orbit. By a foraminal paralysis is meant one caused by a lesion of the nerve as it passes through the sphenoidal fissure. Syphilis causes basal and foraminal paralysis very frequently by inflammation or degeneration of the nerves, or by pressure upon them by meningitis, periostitis or gummata. The third nerve is particularly prone to be attacked by a gumma at the base of the skull, especially at the sphenoidal fissure, ptosis being the initial symptom. Basal lesions may affect one or more nerves, and sometimes affect both sides at the same time. Facts pointing toward the paralysis being of basal origin are:

a number of nerves being affected in succession; neuralgia of the trigeminal; certain visual disturbances like blindness of one eye, caused by atrophy of the optic nerve or temporal hemiopia; paralysis of the olfactory nerves.

By nuclear paralysis is meant a paralysis caused by a lesion in the nerve nucleus. The lesion may be so situated that it will press upon the nerve fibers after they leave the nucleus and before they unite to form the nerve trunk, in which case it is spoken of as being a fascicular paralysis. Syphilis causes paralysis of this kind by producing atrophy and degeneration of the nucleus and root fibers; or by vascular changes (arteriosclerosis, endarteritis, miliary aneurisms) which result in anemia, hyperemia or hemorrhage; or by the pressure of gummata.

According to Gowers, sudden nuclear palsy is usually due to a vascular lesion which is generally obstruction of branches given off by the basilar artery. The obstruction is usually bilateral, because syphilitic disease of the basilar affects the branches given off at this spot on each side. A single muscle is not often paralyzed by a nuclear lesion. In paralysis of the oculomotor nerve where the intraocular muscles are not affected, the lesion is generally supposed to be nuclear, the nuclei for the sphincter of the iris and the ciliary muscle being some little distance from the nuclei of the third nerve fibers supplying the extraocular muscles and, therefore, not always involved with them. That form of ophthalmoplegia known as Wernicke's polioencephalitis superior is invariably caused by a primary affection of these nuclei. Any lesion affecting the cortex or the nerve fibers above the nuclei does not, as a rule, paralyze individual muscles, but produces what is known as conjugate paralysis; that is, a paralysis of the coordinated movements of the eyes, such as convergence, lateral movements, or any movement where the two eyes move together by one nerve impulse. An exception has been made of ptosis, which it has been thought has been caused by cortical lesions in a number of cases. This, however, is doubted by others.

Paralysis of convergence is most frequently due to tabes, syphilis taking second place as the cause of this trouble.

Paralysis of the intraocular muscles is caused by syphilis more often than by any other disease. Tabes and progressive paralysis are also responsible for some cases. The lesion is

generally thought to be nuclear. It may be unilateral or bilateral, the former being twice as frequent as the latter. This condition, especially the unilateral form, is likely to remain unchanged for a long time, although the greater number of cases recover eventually.

Another paralytic affection of the intraocular muscles is the loss of the pupillary light reflex (Argyll-Robertson pupil). In this condition the pupil does not contract when light is thrown into the eye, although it does react to accommodation and convergence. The seat of the lesion in these cases is not definitely settled, but Weeks says the weight of evidence indicates a lesion in the vicinity of the nucleus of the third nerve. Some authorities, as Uhthoff and others, claim that all cases of Argyll-Robertson pupil are due to syphilis. Others deny this, but all agree that in the great majority of cases syphilis is responsible. Most cases of *tabes* have this pupillary condition. Uhthoff says 67 per cent, Gowers, 80 per cent, while Stern places it as high as 90 per cent. Other pathologic pupillary conditions that may be caused by syphilis are: Loss of convergence pupillary reaction, loss of sensory or psychical reflex action, anisocoria, and paradoxical reflex.

The cranial nerves are most likely to be affected by syphilis in its late stages, and gummatous meningitis is by far the most common cause of ocular paralysis, the nerves being compressed or inflamed. However, since salvarsan has been used in the treatment of syphilis, the close watching and study of cases thus treated has revealed the fact that meningitis is much more likely to occur early in the second stage of syphilis than had been thought, and it seems to be the consensus of opinion that the paralysis of the ocular muscles, as well as the affections of the optic and auditory nerves that have followed the use of salvarsan, are caused by a meningitis due to the syphilitic virus and not to the drug used. Hence, these ocular conditions may be expected in the secondary stage of syphilis as well as in the tertiary.

The treatment of ocular paralysis due to syphilis demands, first, active antisyphilitic therapy and, aside from the treatment of the cause, such measures as would be appropriate for similar conditions due to any other disease.

XV.

SOME OCULAR SYMPTOMS OF SYPHILIS OF THE NERVOUS SYSTEM.*

MEYER WIENER, M. D.,

ST. LOUIS.

Gowers, in a lecture delivered before the Medical Graduate College in October, 1902, made the statement that "there is no syphilitic disease of the nerve structures. But the term 'nervous system' includes also the neuroglia which supports and separates the nerve elements, the blood vessels which penetrate and permeate the centers, and the membranes which enclose and support them. These structures are among the most frequent seats of the morbid processes of constitutional syphilis."

Thus it can be seen that syphilitic treatment acts only on the specific process. It has no direct influence on the secondary changes by which the symptoms are produced.

If we have a choked disc or paralysis of one of the eye muscles, it does not follow that because the origin is syphilitic and the process is arrested, that the blindness or impaired motion will not be permanent; for the damage already done may be sufficient, by scar contraction, to completely inhibit further function.

There are certain ocular signs which have an undoubted value in the diagnosis of syphilitic diseases of the nervous system. The most useful of these, and consequently the most universally known, is the Argyll-Robertson pupil. While it seems to be generally accepted that an Argyll-Robertson pupil always means tabes, Uhthoff, in *Gräfe-Samisch Handbuch der gesamten Augenheilkunde*, states that at least 4 per cent of cases are idiopathic.

I have seen pupils which were pronounced Argyll-Robertson

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by good authorities, which to my mind had no right to be so taken. I have one case in mind, seen in consultation here with Dr. Schwab and Dr. Dock, where the patient had been told by several of the most eminent neurologists and ophthalmologists of the country that he had an Argyll-Robertson pupil, and that it most probably was the forerunner of beginning tabes. Now, this patient's pupils were dilated; one of them reacted neither to light nor accommodation, the other reacting very feebly to light and slightly more to accommodation. He has had seven or eight Wassermanns made, all of which were negative, as well as two spinal punctures, also negative. This patient consulted Dr. Henry Head during the past summer, in whose opinion there had been a toxic involvement of the third nucleus several years ago, which left the pupil in its present condition, and, in his opinion, there is now no progressive trouble. I am citing this case as a warning that symptoms which simulate a typical syphilitic condition may have quite a different cause.

Regarding the diagnostic import of involvement of the ocular muscles, I need merely quote Uhthoff, who gathered an enormous amount of statistics and concludes that 20 per cent of all ocular muscle paralyses are due to tabes; and that 20 per cent of all cases of tabes have involvement of the ocular muscles at some stage.

There are two points which I wish to bring out, one of which is that we must not always consider syphilis as the sole cause of an ocular disease, even though we get a positive history of syphilis, as well as a positive Wassermann reaction.

A case which came under my observation only recently, illustrates this point. Mr. M. H., fifty-two years of age, first came for consultation August 31, 1910, complaining of failing vision in the right eye. His visual acuity, right, ability to count fingers on the temporal side of his field; visual acuity, left, was 14/20. There was a retinal detachment involving the temporal half, seen through a cloudy lens. Tension was normal. On June 31, 1911, the condition was about the same, excepting that the lens was more cloudy and the tension was slightly elevated. On February 2, 1911, he came with an edema of both lids, which subsided within a few days. A diagnosis of probable intraocular growth was made and an enucleation was advised.

The patient did not reappear again until the early part of July, 1913, when he showed a very pronounced swelling in the right orbit, pushing the eyeball out to a marked degree. This swelling was hard and painful on manipulation. Wassermann test was positive, and this in the face of the fact that the patient was a hard drinker. The swelling reduced considerably under mercury and iodids, but owing to an infected ulcer of the cornea, due to exposure, the patient suffered such severe pain that he finally consented to an operation.

The growth, together with the eyeball, was removed and examined by Dr. Alt. It proved to be a sarcoma of the choroid and a perithelioma of the orbit.

On the other hand, I have under observation a patient who consulted me last spring, suffering with severe headaches. She had glasses prescribed at various intervals by different ophthalmologists, without relief. The headaches became more severe and more frequent, lasting several days, during which time she was confined to her bed. I found her visual acuity normal with her correction. Pupils equal, with normal reaction to accommodation and light. Fundus normal except a slight blur of the upper portion of each disc.

Examination of the visual fields showed a bitemporal contraction of about twenty degrees, with an inversion of the color field at the left outer upper quadrant, which Cushing considers almost pathognomonic of beginning brain tumor.

With much persuasion a Wassermann was finally made, which was 3 positive. Under salvarsan and mercury and iodid potassium this patient has steadily improved.

Now, there is a question in this case as to how great a factor the syphilis plays. Have we here to deal with a gumma, located at the base and pressing against the commissure, or is there a growth of the hypophysis independent of the syphilitic process? Time alone and careful observation of the fields of vision and optic discs can determine.

XVI.

THERAPEUTICS OF OCULAR LUES.*

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ST. LOUIS.

Not a great deal of interest to general practitioners can be said of the therapeutics of ocular lues. However, much might be discussed of those factors which are intimately and closely bound up with therapy. A consideration of therapeutic measures is inseparable from that of diagnosis and methods of diagnosis, but lack of time will allow points to be but superficially touched upon.

Intelligent therapy is based upon a comprehensive and intelligent observation of the case. Much of the criticism which therapeutics has been forced to bear was a result, not of faulty therapy, but of faulty diagnosis. It is self-evident that anti-luetic treatment is of no avail in a tuberculous process. The diagnosis of lues is often assumed on general principles. There is no reason why an individual with a former lues may not suffer a nonluetic ocular inflammation; yet in such a case we are usually inexorably prejudiced in favor of syphilis as the etiologic factor.

I trust I may be pardoned for apparently digressing from the subject and at the end, in referring to several cases observed lately, which apparently have an important bearing on the matter in hand.

Several therapeutic measures have been referred to in preceding papers, so there may be an unavoidable repetition of statements. Therapeutics of ocular lues is broader in scope than one might casually infer. Treatment is naturally divided into local, general, and specific. Local measures will be lightly touched upon, as they rightly and wisely should be left to the ophthalmologist. Two may be mentioned which at

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times prove of great assistance; they are dionin and subconjunctival injections.

The former acts at times exceedingly well in cases of iridocyclitis, keratitis and iritis; especially those in which great pain is a prominent feature, although there is complete dilatation of the pupil and the ciliary body is totally at rest. The beneficial results are supposedly due to an opening up of the lymphatic channels, thereby accelerating the absorption of inflammatory products. It should not be used in elderly patients with marked arteriosclerosis. (An interesting incident occurred a few weeks ago at the Children's Hospital. A mother stated to Dr. Green that every time she used the medicine in the child's eyes he went to sleep. The drug was dionin. It is a morphin derivative, so there is probably something in the mother's observation.) For subconjunctival injections a hypertonic salt solution or weak dionin solution may be used. Injections of solutions of the mercury salts have never become popular, though reports concerning their use have been good. Even when combined with aconin, which mitigates the pain to some extent, they are so painful and produce such a violent reaction, that few have the hardihood to use them.

That there is a patient behind the disease is a fact often ignored. Lues is debilitating, consequently roborant treatment is necessary. Cod liver oil, syr. iodid of iron and Fowler's solution may be exhibited with benefit. This is especially true of children who suffer profoundly from the blighting influence of syphilis. Thyroid extract is a general remedy which has been reported upon favorably, especially in the treatment of parenchymatous keratitis. It is used empirically. How it acts is not clear; probably by some unknown influence it exerts on certain internal secretions. Diaphoresis is an effective general measure fallen into disuse. Its efficacy has been demonstrated in acute troubles such as neuritis, retinitis, choroiditis, etc. It should be carefully used and not pushed to the point of weakening the patient. For that reason pilocarpin hypodermatically has been abandoned and milder methods substituted. A sufficient sweat can usually be produced by a fifteen grain dose of aspirin, a hot lemonade and a warm blanket. These sweats may be induced daily if desired.

Before considering the so-called specific treatment, mention

will be made of the Wassermann test and a plea made for more exact clinical investigation. With the advent of the Wassermann test, which in importance does not take second rank even to salvarsan, there was a tendency on the part of many to sweep aside the whole field of clinical medicine and pin their faith to laboratory findings. Laboratory methods are not to be deprecated, they are of signal service, but they are adjuvants. Often without clinical investigation a patient is put through a Wassermann test made by a competent and sometimes incompetent serologist; the report comes back faintly positive, and the patient is at once subjected to salvarsan. Indeed, in some instances the necessity of making a Wassermann test is viewed with indifference and wholly neglected. The clinical history and examination plus the Wassermann test should always be our therapeutic guide. The whole subject is too young to allow of dogmatic statements. It may be possible that influences yet unknown can bring about a positive Wassermann test in the absence of those conditions now known to produce it. It may be present during and after a long course of mercurial treatment and after salvarsan. We are sometimes puzzled by the results of the test. The Wassermann and other tests have helped us in this, that the lines between luetic lesions and similar appearing ones due to other causes are becoming more sharply demarcated. With the increasing certainty in our diagnosis of luetic affections, more diagnoses of tuberculous processes are being made. This is particularly true in choroiditis, scleritis and sclerokeratitis.

We come now to the specific remedies, mercury, iodids and salvarsan. Up to the birth of salvarsan, our faith was placed in the use of mercury and iodids. They served us well and are yet serving us well. The use of these remedies is familiar to all. The question, an old one, resolves itself into what is the best method of administration. The internal use of mercury, whether in the form of blue mass, protoiodid or bichlorid, is relatively slow, inexact and uncertain, and the gastric and intestinal irritation occasioned often prohibits their use. A convenient, quick and more exact method is the intramuscular injection of mercury. Opinion is divided as to whether the soluble or insoluble preparations are most efficacious. The injection of bichlorid solution has been very satisfactory in the hands of many men who have used it. My personal feeling

is that the inunction method is highly gratifying and result producing. Were it not for the fact that it is dirty, troublesome and conspicuous to the household, it would be held in greater esteem. The use of mercury will continue, even with salvarsan in the field. In some directions its application has been extended. Many acute observers are of the opinion that mercury given alone produces equal or better results than when iodids are simultaneously given. The iodids have no effect on spirochetæ, and their office is in aiding in the absorption of exudates, infiltrates and new formations.

The advent of salvarsan into the field of therapeutics has completely revolutionized our ordinary procedures. The last word has not been said regarding it. Its status, toxicity or lack thereof has not been definitely settled. Contrary to the belief of its enthusiastic supporters, it is still on trial. Salvarsan, of which too much was expected, has not lived up to expectations in the treatment of ocular lues. The best results with it in eye cases have been in affections of the uveal tract. In other respects the benefits have been mediocre. Past experiences with atoxyl and other arsenicals have shown us that they are dangerous remedies. Optic neuritis and atrophy were of too frequent occurrence to be disregarded. We were told that salvarsan had been robbed of the vicious qualities. This remains to be seen. In view of the possible dangers and limitations of salvarsan, always remembering that it is an arsenic compound, it will be well if we curtail its promiscuous administration. It may seem superfluous to here again draw attention to the fact that previous to every salvarsan injection a careful ocular examination should be made. It should be done for several reasons: (1) To protect the patient; (2) to protect the physician, and (3) to save salvarsan from unjust criticism.

In those cases in which an optic neuritis is present, it is questionable whether salvarsan should be used or not. At present, when there are some grounds for believing that it may inaugurate a neuritis, it may be best to avoid using it. Some will contend that salvarsan never did produce a neuritis, but they have nothing more than an opinion to substantiate their contention.

The two cases which I now briefly report may throw some light on this subject. A casual reference will be made to a

third case, occurring in the practice of another oculist, which he did not consider a parallel one to mine. I have not permission to report it.

The first patient had an unmistakable lues, had had a Wassermann test made, the result of which was not known. He was given an intravenous injection of salvarsan. His skin eruption promptly cleared up, and the immediate effects were marvelous. About four weeks later I saw the patient and found a left neuroretinitis, together with symptoms of involvement of the whole uveal tract. The right eye showed the same conditions in a more advanced stage, but the media were so cloudy that a good view of the fundus could not be obtained. The patient was put in a hospital, and local and general measures rigidly carried out. Things went from bad to worse. As the whole trouble was attributed to lues and salvarsan acquitted as an etiologic factor, a second dose was given—this time neosalvarsan, intramuscularly. No beneficial results ensued. The process slowly quieted down and the patient left the hospital totally blind in both eyes. It was the most malignant intraocular inflammation I have ever seen.

The second patient received salvarsan intravenously, last spring, for a syphilitic stomach trouble, according to his statement. Three months later there rapidly developed in his left eye a neuroretinitis and iridocyclitis. Inunctions were ordered and local treatment carried out. The conditions quickly responded to these measures, pain disappeared and the inflammation subsided, but the eye is totally blind except that he can perceive hand movements in the extreme limits of the temporal field.

The third case, referred to before, had a history not exactly identical with the second, but the result was a totally blind eye.

In these cases while the ocular condition, lues and salvarsan may not have had anything in common, yet the sequence of events can hardly be evaded or ignored. In my cases I have not the temerity to assert that the ocular events were due to salvarsan, but do say that it is not, like Caesar's wife, above suspicion. One fact is patent: if salvarsan did not cause the trouble, it certainly did not protect the eye against a most rapid and destructive inflammation and, at that, one occurring soon after injection. The argument may be raised that the same thing occurs under mercurials. That may be very true.

A hitherto well eye may light up with a fresh inflammation while a similar process is subsiding in the previously affected eye, the patient at the time being thoroughly mercurialized. Such instances are rare, and it is to be hoped that such experiences with salvarsan are likewise.

In conclusion, it is to be regretted that the idea is prevalent to a great extent among the laity that one or two doses of salvarsan positively cures and forever protects them against the ravages of the infection. This notion has been fostered by charlatans and by some of the less conscientious of the regular profession. Such an impression, if widespread, may in the future lead to much harm through a false sense of security and the loss of many eyes which might have been saved by a more thorough and vigilant therapy. Who can say that in twenty or thirty years the ranks of the blind and paretic may not be just as full as at present.

XVII.

SALVARSAN AND THE EYE.*

JOHN GREEN, JR., M. D.,

ST. LOUIS.

The aim of this paper is twofold: first, to give, as briefly as possible, a summary of recent ophthalmologic opinions as to the efficacy of salvarsan in syphilitic and nonsyphilitic ocular diseases; and second, to indicate what ocular conditions contraindicate the exhibition of the drug in the presence of syphilitic lesions elsewhere in the body.

In the few reported cases of syphilitic disease of the eyelids, both primary lesions and the later specific tarsitis, salvarsan has acted effectively, and promptly: the chronic inflammatory thickening of the lid, so characteristic of the latter affection, has quickly subsided. Chancre of the conjunctiva has also healed readily following the administration of the drug.

The earlier reports were generally favorable as to the effect of salvarsan in many specific ocular diseases. However, amidst the chorus of approval there was one discordant note: the drug seemed to have little or no effect on interstitial keratitis due to inherited syphilis. The opinion was expressed that this failure was due to the fact that the cornea, being an avascular structure, the drug reached the tissue in a too attenuated form. It was not until salvarsan and neosalvarsan began to be administered in repeated doses, and mercury freely exhibited in the interval, that favorable results were reported. But even today there are many ophthalmologists who pin their faith to the older treatment, believing that,

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after all, salvarsan does little more than lessen photophobia and ciliary injection.

All are pretty well agreed that in the nodular type of syphilitic iritis, which usually occurs during the course of a florid cutaneous eruption, salvarsan acts promptly and at times almost magically. Indeed, there are not a few cases reported in which a definitive cure has been effected in a few days. Of interest in this connection are the observations of Morax and Fourriere.¹ They noted that in cases of iridociliary or choroidoretinal syphilitic lesions which had induced secondary glaucoma, and in which tension remained high in spite of miotics and iridectomy, salvarsan effected a rapid resolution of the lesion with a coincident fall in intraocular tension.

Syphilitic lesions of the choroid have yielded readily to the administration of the drug, especially in those cases in which repeated injections have been preceded and followed by intensive mercurialization. It is certain also that retinitis and neuroretinitis of syphilitic origin have in many cases been favorably influenced by salvarsan. Stuelp² records that of seventy-six cases of neuroretinitis treated by salvarsan, a rapid and good result was obtained in 63 per cent, and no result, or a relapse after a primary good result, occurred in 37 per cent.

Opinion is divided as to the efficacy of the drug in specific oculomotor paralysis. Certainly, if all of these cases are grouped together, the failures outnumber the successes. The more recent the paralysis the more likely is one to secure a restoration of function.

The earlier trials of salvarsan by ophthalmologists were made with great caution, for all of us had learned to fear possible disaster to the optic nerve following the use of certain of the newer arsenic preparations, notably atoxyl and soamin. There is recorded a number of well authenticated instances of retrobulbar neuritis eventuating in optic atrophy after the administration of atoxyl, and Ehrlich, fearing a similar untoward effect from arsenobenzol, warned against the use of the drug in any patient showing signs of optic neuritis or retinitis.

It was some time, therefore, before oculists ventured to use

the drug in these cases, even when fully convinced of the syphilitic nature of the optic nerve inflammation. However, those who ventured into this supposedly dangerous field were not infrequently rewarded with a satisfactory result, and as there did not appear to be any great danger of arsenic poisoning of the optic nerve, the drug came to be used in these conditions with more and more freedom. It seems to be pretty generally accepted that so long as the neuroretinal lesion is, beyond cavil, of syphilitic origin, salvarsan is indicated, although the best effects are obtained when the drug is associated with mercury and the iodids.

The question of the efficacy of salvarsan in optic atrophy of syphilitic origin is still sub judice. I presume that most ophthalmologists will agree with Reese,³ that in spinal atrophy "the administration of salvarsan has apparently hastened the inevitable end." Nevertheless, there are some authors who believe that occasionally salvarsan improves simple optic atrophy, and affirm that there is no well authenticated instance of rapid deterioration of vision following the administration of the drug. This view is shared by Dolganoff,⁴ who states that arsenobenzol has no deleterious or hastening effect on the degeneration or blindness.

In recent years it has been found that the blood of patients suffering from sympathetic ophthalmia shows a condition similar to that obtaining in protozoal diseases, i. e., a large increase in the mononuclear leucocytes, with a corresponding diminution of the polymorphonuclears. Accordingly, Browning⁵ and others have used salvarsan in patients suffering from sympathetic ophthalmia. In seventeen cases thus treated, the effect of the administration was to reduce the mononuclears nearly to normal, with coincident improvement in the eye condition. Relapses, however, were frequently noted, but a second injection again restored the blood to a relatively normal condition, with improvement in the eye. It must be said, however, that Browning's results have not been generally confirmed.

Many cases are on record in which optic neuritis and paresis of the motor nerves of the eye have followed the injection of

salvarsan, and the question is being keenly debated whether these affections are, as the name "neurorecidiv" implies, of a syphilitic nature, or are evidences of the injurious action of the arsenic drug. There can be no gainsaying the fact that oculomotor paralyses have occurred more frequently since the widespread use of salvarsan than in the days of mercurial therapy. Indeed, a few cases of total ophthalmoplegia have been noted as early as eight weeks after injection. (This condition is exceedingly rare so early in the disease.) Of 370 cases of syphilis treated with salvarsan, five showed early ocular muscle palsy, whereas of 5,000 cases of syphilis treated by the older methods, only three showed this condition. The fact that these palsies have come on about the same time, viz., two or three weeks after the injection, makes one suspect that the drug is the factor. Nevertheless, many of these palsies have cleared up after a second injection of salvarsan, or after a vigorous course of mercury, so that, after all, the paralysis may be due to syphilis rather than to the drug.

Optic neuritis and neuroretinitis with hemorrhages have been noted in previously healthy eyes following the administration of salvarsan, but in these cases, too, it is generally conceded that the neuritis, which is a not rare episode in syphilitic processes, howsoever treated, is more likely to be due to the spirochete than to the drug. In short, therefore, it may be said that should a syphilitic disease of the eye appear after the administration of salvarsan, the indication is to continue vigorous antisyphilitic treatment. There seems every reason to suppose that further injections of salvarsan will aid rather than hinder the reparative process. No doubt some cautious ophthalmologists will not care to run what they may regard as a risk, and will prefer to continue the treatment with mercury alone. De Lapersonne and Levi¹⁰ state that there is no need to exaggerate the dangers of salvarsan as regards vision. Contrasting the effect of atoxyl with that of salvarsan, these authors state that "atoxyl may give rise to true subacute retrobulbar neuritis, manifested by definite signs comparable with the toxic neuritis, experimental and pathologic, due to the effect of quinin, male fern extract, car-

bon bisulphid, etc. So far, no such toxic neuritis has been described following the use of salvarsan." Ehrlich⁷ found, among 30,000 cases of syphilis treated with salvarsan, only one in which a previously healthy eye showed signs of beginning atrophy after the injection, and this patient had previously received courses of treatment with atoxyl and enesol, both arsenic compounds.

OCULAR CONTRAINDICATIONS TO THE EXHIBITION OF SALVARSAN.

Stuelp states that the sole contraindication to the use of salvarsan, from the oculist's standpoint, is the presence of nonsyphilitic retinitis or optic neuritis. Blanco⁸ also believes that the presence of nonsyphilitic ocular disease should be considered a contraindication to the use of the drug. In his experience, damage to the ocular structures following the injection of savarsan is very rare; nevertheless, in view of our still rather limited experience, he demands that the fundus oculi should be examined in every case before treatment. Dolganoff concludes that salvarsan employed in ordinary doses does not act as a poison on the eye, as do some other organic compounds of arsenic. Even where the remedy appeared to be contraindicated on account of some pathologic condition of the optic disc, its administration did no harm. Experimental observations by Igersheimer⁹ tend to prove that in rabbits and dogs salvarsan produces no pathologic changes in the retina or optic nerve. Cats, who are more susceptible to arsenic, showed degenerative changes in these tissues after salvarsan injections. Gebb¹⁰ has considered the question of the influence of salvarsan and neosalvarsan on the papillo-macular bundle. He noted no toxic effect on these nerve fibers, and found that the drug acted favorably when they were involved.

CONCLUSIONS.

Salvarsan, by acting quickly, is of most use in acute syphilitic troubles that threaten the integrity of the eye. Ocular lesions appearing after salvarsan injection should probably be regarded as a further manifestation of syphilis, and treated

by more salvarsan and mercury. In chronic cases the drug does not do nearly so much good. It does not appear to have any poisonous effect on any of the tissues of the eye. There is certainly no ground for the belief that salvarsan causes atrophy of the optic nerve through a direct toxic effect.

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XVIII.

A CASE OF THROMBOSIS OF THE RETINAL VEIN, WITH REMARKS.*

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On December 26, 1912, a spinster of forty-four years, strong and healthy in every respect, consulted me concerning a big "block" of smoke which appeared suddenly in front of her left eye, and particularly toward the nose, in the morning, just after rising; it got a little bit better during the day. I saw her on that date and made the following observations: Right eye, normal; left eye, optic disc very red; both upper and lower veins much enlarged, crooked and blue black; small superficial feathery hemorrhages between disc and macula; no difference in size of pupils, direct reaction in both eyes quite marked, consensual and accommodative sluggish; tension normal; tongue rather thick and slightly gray; patient felt perfectly well in every other respect.

On December 27th, a slight hemorrhage on optic disc surrounding the lower vein, filmy in character; condition of optic nerve about the same as yesterday, except the veins are still more enlarged and tortuous; several more hemorrhages of same character in the neighborhood of the macula; a branch of the superior central vein surrounded by a white exudate; field of vision generally blurred and a small islet of scotoma about 20° horizontal, which is about 4 by 4 mm. in size. Ordered examination of urine, which showed indican, a trace, a few squamous epithelial cells, occasional leucocyte; no casts; sugar none; albumin none; reaction acid; specific gravity, 1025.

On December 28th, little or no change since yesterday; no increase in hemorrhage; blood pressure 124; pulse 82; Wassermann reaction negative.

*Read at the meeting of the American Ophthalmological Society, at Washington, D. C., 1913.

On December 31st and January 3d, vision in left eye about same as the first examination. Between these two dates a large circular hemorrhage appeared below, involving both inferior principal veins; optic disc became very much more swollen, giving the appearance of choked disc. Ordered five drops of kalium iodid, t. i. d., notwithstanding the negative Wassermann.

On January 6, 1913, reduced kalium iodid, t. i. d., to three drops; could not stand five. No involvement of any of the collateral sinuses; nothing pathologic in nose or throat. Whole background of the eye has appearance of choked disc. Three days later the heart was examined by a specialist and found to be normal.

January 16th, large hemorrhage below still present, but drying up; increase of the feathery hemorrhages toward the macula and beyond; optic disc still more swollen; several small hemorrhages around the macula noted. V. L. E., = 23/40, with + .75 D. c. axis 90°.

January 23d, optic disc has the classic appearance of choked disc, intensely swollen; several vessels with the twist of corkscrews on disc and immediately near it; just beyond the macula a number of small round hemorrhages that are not feathery; V. = 23/50, with correction.

February 3d, condition in all respects about the same as last observation.

February 14th, fundus commencing to clear up; hemorrhage below much smaller; region between disc and macula clearer; number of the feathery hemorrhages gone; edges of disc clearer though still very blurred; V. = 23/50 partly.

March 3d, optic disc seen easily; large hemorrhage below still smaller; swelling of veins less pronounced; feathery hemorrhages apparently gone; a few round ones outside of macula still present, but faint. V. = 23/30, with correction.

March 25th, large hemorrhage below disappeared, but vein dilated where it existed; optic nerve much better but still somewhat blurred; the tightly twisted blood vessels on the surface of the disc still persist; only one feathery hemorrhage beyond disc still observed; V. = 23/30, partly, with correction.

Drawing of fundus was done by Dr. Percy Fridenberg about January 20th.



Thrombosis Retinal
~~Thrombosis~~ of the ~~Retinal~~ Vein.
(DR. J. HERBERT CLAIBORNE)

Michel was the first to demonstrate anatomically thrombosis of the central retinal vein, and I think it may be said that his investigations and views are entitled to the first place in the study of this subject. He recognizes three degrees of intensity in this condition, to wit: complete obstruction, partial obstruction, and simple stagnation of the current of blood in the vein, and as the corollary to these primary conditions, the terminations complete and permanent occlusion, partial and complete restoration, and reestablishment of the permeability of the lumen of the vessel.

The conditions or causes underlying thrombosis of the central vein are, generally speaking, Bright's disease, diabetes, lues, marasmic conditions, erysipelas of the face or nose, and infections involving the facial veins, such as generally cause thrombosis of the cavernous sinus, infections from the collateral sinuses and nose, glaucoma, pernicious anemia, metastasis, as a concomitant of choked disc, and, finally, arteriosclerosis.

Cases have been reported and studied by Michel, Angelucci—the diagnosis of whose three cases was questionable—von Zehender, Haab, Goh, Weinbaum, Schnavel, Wagenman, Würdemann, Putscher, Thoma, and others. Thrombosis of the vein is usually situated in one of the central veins of one eye, and presents a very striking ophthalmoscopic picture. Goh's case was bilateral and was associated with if not caused by marasmus, but I think the condition in general may be considered unilateral, and in the nature of things would be so, except when it occurs as a concomitant of double choked disc. Heart disease has been assigned as a cause, but for my part I can conceive of that disease being a cause only if we admit that the character of the blood itself is changed; certainly no embolus, however small, can find its way from the heart through the main arteries out to the periphery, be taken up by the capillaries, and produce thrombosis either in a branch or the main vein. An embolism of the artery, partial or complete, would necessarily result from such condition, and the process would be embolic and not thrombotic. Glaucoma has been mentioned as a cause and as a result of embolism, and it is not unreasonable that it might play either role. Certainly intense pressure might cause changes in the intima of the retinal veins, and primary thrombosis might cause increased

intraocular pressure. We are all familiar with the picture of thrombotic veins in hemorrhagic glaucoma; but who, when such a case is seen for the first time in the stage of active eruption, can tell whether the glaucoma has caused the thrombosis or the thrombosis the glaucoma? By the history of the case alone can such a question be determined. We have to admit that both do exist at the same time, and it is not improbable that each produces its effect upon the other by what is known as the vicious circle.

Leber and Wagenmann have expressed the belief that multiple emboli in the retinal arteries may produce the same ophthalmoscopic picture as thrombosis of the central vein. Haab expresses his agreement with this view, but gives reasons that to me are not convincing. For my part, I unhesitatingly pronounce with the two former observers and even go further.

Looking carefully over the picture illustrating the thrombosis in this case, one cannot help being struck with the likeness to choked disc. The disc is evidently choked, the retina swollen, the hemorrhages numerous; whether they be venous or arterial cannot be exactly determined in some instances. The picture likewise resembles that of complete embolism of the central artery. The absence of the red cherry spot at the macula, however, saves the diagnosis.

In this case the choking of the disc is late; whereas in pure choked disc the choking takes place first and the thrombotic and embolic processes come later. Time is certainly an element in the differential diagnosis. Haab remarks also that albuminuric retinitis presents a very similar process, which no one can doubt, and this leads me to the thought I desire to present, that pure thrombosis can be diagnosed solely when the case is seen and studied from its very incipency. In short, the thrombosis may be a symptom or a concomitant of certain well known processes. Of course, thorough examination of the patient must be made, and by this means the cause will usually be found among those cited.

This case, however, makes an exception to the rule. As will be remembered, there was no albumin, no sugar, no casts: in short, no disturbance whatever of the kidneys nor any other general disorder. The first examination of the urine was made December 27, 1912, and there was found a

trace of indican. The second, made January 28, 1913, showed a moderate amount of indican. This phenomenon points to the intestine and not the kidneys, but has in my opinion little significance.

I think it can be said in general that in order that a thrombosis may exist in a vein, there must be postulated a solution of continuity in the intima of the vessel, and I venture to suggest that from whatever underlying causes it may arise, there is first a rupture in the lining of the intima. These ruptured cells then project into the lumen of the canal, much as an obstruction of any sort would in a stream of water, and, by virtue of the obstruction, fibrin is deposited by degrees on the projected cells, is accumulated constantly, the endothelium is ripped up by the blood current, the underlying layers of the vessel become disorganized, and hemorrhage ultimately takes place. I believe that arteriosclerosis in greater or less degree lies at the bottom of the phenomenon. This would certainly be consistent with all the causes that have been heretofore mentioned.

Possibly some local degeneration of the intima of the vessel was present in this case and was the cause of the condition, unless time shows that there existed some hidden grave constitutional disorder. I believe the cause in this case can be attributed to this weakness of the intima. It is questionable whether this might be called an arteriosclerosis; perhaps it was a localized one. I see no reason why such a thing should not exist. When once the process had become well established in one central vein, the opening through which the vein passed into the cribriform lamina became blocked, there was damming up of the blood in the entire venous current, and consequent swelling of the optic nerve. It will be noted that the arteries are not very small in this case, and never were throughout its whole course; but this fact may be explained on the ground that the aperture of the cribriform membrane through which the vessels passed was only partially blocked by the contiguous swollen veins and the general exudation. When the nervehead becomes more swollen, the arteries naturally get smaller by reason of the increased pressure, and I believe this is the explanation in general for the presence of small arteries in venous thrombosis of the retina.

White areas of degeneration have been mentioned as occurring in the retina in thrombosis, particularly in that form produced by albuminuria, but only one was observed here and that disappeared with the process of absorption. It appeared at all times to me to be a fresh exudation of fibrin. Since there were numerous hemorrhages, and one very large one in particular, and since there were no white degenerative areas, I am led to hold the view of Haab on this point, that the white areas are not due to hemorrhages, but to something else; probably a disturbance in the nutrition of the retinal elements or an abnormal condition of the blood itself.

Though I have seen a number of cases of thrombosis of the retinal veins, I have only studied three of them carefully, and this last one with greater care and for a longer time than any of the others. My first case was published in the *Ophthalmic Record* a number of years ago.

The thrombus occurred in a large, fat, short necked Jewish woman, who became suddenly and totally blind in one eye. Finally, she recovered a small eyelet of central vision, corresponding to the position of the macula lutea, whereas the rest of the field was absolutely and totally blind. Interest in this case lay in the fact that one lower vein alone was affected: about three or four mm. from the edge of the disc it suddenly commenced to swell into a sacculated shape, looking like a small sausage about four mm. in length, was blue black, and seemed on the point of bursting, but it never did. There was a general moderate venous congestion, but other than this no changes whatsoever. The venous thrombosis ultimately disappeared, but the field remained the same throughout the time of my observation, which was about a year. I always thought there must have been some pressure behind the globe. I am unable to find the record of this case, and therefore can make no statement concerning the general condition of the patient.

The second case was one of partial thrombosis. I have a number of times seen this condition, but it has generally occurred near the disc in a comparatively large vein. The thrombosis in this case occurred in a young man of twenty-seven, who noticed a gradual blurring of the vision of his left eye. He had obtained several opinions as to the cause, but there was a difference in diagnosis. I discovered, up-

ward and outward, almost at the periphery of the retina, a well marked thrombosis or swollen vein. There was a moderate sacculatation of the vessel, commencing more or less gradually, and decreasing gradually. Just beyond the sacculated portion the vein was thin and indistinct. A slight degree of exudate but no hemorrhage surrounded the sacculated portion. A scotoma, located by the perimeter, corresponded with the thrombosis.

I have never seen any other case like these two, and I think they are both worthy of record. I lost touch with this young man also, as he took the matter into his own hands. I remember distinctly that his urine was normal and that he was in general good health. The Wassermann test had not been discovered at that time, but he denied lues. It would interest me to know if any one else has seen such cases as these two.

I have already stated that the literature on this subject is not abundant, and the textbooks devote but little space to it. I fancy this may be because the condition is generally associated with some other intraocular change and general disorders.

The one herein described appears to me unique in literature by reason of the absolutely perfect general health of the patient. It is hoped that greater interest may be awakened in this subject, so that the study of these cases in the future may be more thorough.

XIX.

A NOTE ON A CASE OF DOUBLE INVERSION.

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The case here described is that of a boy reported to the department of psychology by a teacher in one of the smaller towns of Ohio. He entered the first primary grade last September and is seven years old. His ancestry is questionable, especially on the maternal side. The father, though ignorant and dull, bears a fair reputation for honesty and sobriety. The mother is illiterate, profane, intemperate, and prior to her marriage was immoral.

During the first month of school he attempted neither reading nor writing, and when threatened grew nervous and convulsive. The only response made during this entire time, after many solicitations, was a statement of his name, James. At the end of the fifth or sixth week of school the teacher won his confidence sufficiently to induce him to attempt a copy which she had written on the blackboard. It was then discovered that the child invariably perceived the letters of the copy upside down and backwards. In his initial writing there was no exception to the double inversion—the right hand letters were placed to the left, and vice versa, and the normal up-down position reversed. Not only was this true of letters and their positions in words, but equally true for eight of the nine digits.

It is interesting to note that so far as could be determined there are no corresponding inversions to the objects of his environment. Whether his early behavior with reference to objects indicated any special disturbance or confusion, or whether practical necessity brought out of the confusion a fairly consistent and stable space relation, is impossible to determine. In response to a question concerning the boy's

early reactions, the father replied: "Some time James didn't look straight, like he didn't see things right, but not now." No concrete illustration could be obtained.

The following examples will illustrate. The words "cow," "come," "in," "see" and "rat," when written on the blackboard, were copied as follows: „woɔ,, „ɔuɔɔ,, „ɪ,, „æɔs,, „ɪɛɪ,, When the words were written upside down and backwards, James invariably copied them right side up and forwards. When asked to copy his own work, the correct relations were employed, but always the inverse of the copy.

The digits 2, 3, 4, 5, 6, 7, 8, 9 were copied as follows:
7, ɛ, ɪ, ɛ, 9, ɹ, 8, 6.

That the defect is amenable to corrective experience so as to meet practical needs is evident from the progress he is making. The words given above are at this time (after six months of school) usually written correctly when copied, not always. It is probable that the top position as he sees the letter may come to mean the bottom, and vice versa, and that his adjustments to writing symbols, through necessity, may become fairly efficient. This, however, does not remove the cause of the inversion, much less explain it; the defect is merely hidden.

It should be added that according to the Binet-Simon scale of intelligence, the boy tests out six years of age. He is not left handed.

Note: The writer solicits correspondence regarding an actual or theoretic explanation of the phenomena described above. A complete account of this case will follow at a later date.

XX.

STEEL IN THE EYE AND SUICIDE.

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It goes without saying that the slightest particle of metal or other foreign substance in the vitreous will ultimately and surely lead to blindness. In almost all cases where there is a foreign substance lodged in the interior of the eye, the same must be removed or the eye will have to be enucleated.

Case 1.—Fifteen years ago I was called to a village near Dayton, Ohio, to attend a young man, aged twenty-five years, who had knocked a piece of steel through his cornea while trying to split timber by hammering on the head of a hatchet. The piece of steel ploughed its way through the cornea and lens, and went through the sclera at the back and outer part of the eyeball, lodging in the fat. This caused a traumatic cataract. The eye was greatly swollen for three or four weeks, but finally quieted down. I offered to remove the traumatic cataract, but before the operation the patient went to Alberta and bought a large farm. I had explained to him that in case he did have the cataract removed he would have to wear a thick glass, and that at best the new eye would not harmonize and focus with his good eye. Many years have passed and he has had no trouble with the blind eye. It never was operated.

Case 2.—Frank T., aged eighteen years, was helping his father in his blacksmith shop. While pounding iron a piece of metal flew into his eye. After a short rest he continued to help his father, but in a few days the eye began to blur, and he consulted an oculist, but took only one treatment. The next day he shifted to Dr. G. (oculist), who treated the case two or three times a week for six weeks, but the eye grew more painful and watered a great deal. Then he came to me and I said if there were no steel in the eye he should have gotten well in two or three weeks. I advised immediate enucleation, and called in Dr. V. Z. Miller to give the ether. His

father and relatives came to my office and gave their consent, but the boy backed out at the last moment, and did not come back for a few days. Then the eye was enucleated and the steel found in the vitreous, but the operation was too late, as the other eye was affected by sympathetic ophthalmia. Dr. Dolina was called in consultation. We could see the disease coming like a storm from the back into the vitreous. We injected corrosive sublimate under the conjunctiva, but all medical aid was powerless to stay the progress. I had to go to Cincinnati to attend the State medical meeting, and Dr. Dolina was given full charge of the case. He continued in charge of the case for one year, but no sight could be restored, and the boy in a fit of despair shot himself. They tried to sue Dr. G., but my testimony stood in the way, and the case was dropped.

Case 3.—Mr. T., aged forty-five years, while working at the Davis Co. got a splinter of steel in his eye. He came to my office, but I was in Cuba, so he took treatment from a family doctor. The eye became blind, and on my return he showed me the blind eye. I dilated the pupil with one per cent solution of atropin, and discovered a piece of steel in the lens. I advised removal of the lens, but as the eye was quiescent, the patient kept on working as foreman machinist. He moved to Detroit and did not return for operation for eight months. By this time glaucoma had destroyed the chances of saving the eye. The eye was eviscerated and the patient returned to Detroit cured, but minus the eye.

Case 4.—L. B. W., aged twenty-five years, married, two children, has one eye blind since the age of seven. He was chiseling steel, when a piece flew into his good eye, blinding it. He was brought to my office by Harry Haas, the first aid man at the N. C. R. Company. The magnet was applied and the steel popped out, but the patient was blind with traumatic cataract for five months, waiting for it to ripen (the Smith operation cannot be done under the age of fifty or sixty, because the zonula cannot be torn loose easily except in old people). The cataract was removed and the patient had good sight restored, resuming his work as an assembler at the N. C. R. Company.

Case 5.—N., aged twenty-eight years, plumber, was hammering and knocked a piece of steel into his eye. It penetrat-

ed the iris, missing the lens and fell down, so that I had to make a counter opening below. I extracted the steel with the Victor giant magnet. The capsule was injured slightly, but the patient recovered perfect sight.

Case 6.—In November, 1913, P., aged forty-six years, knocked a piece of steel into his eye while working at the Platt Iron Works. Dr. Duckwald refused to handle the case. I extracted the steel with a magnet and restored his eyesight.

Case 7.—A boy, aged sixteen years, was a watchmaker's helper and was hammering silver when a piece became lodged in his lens. He went to his optician, who showed the case to a family doctor. Neither saw the foreign body in the eye, but saw the scar, and said it was liable to ulcerate. Two months later I was consulted, and after dilating the pupil with atropin, easily detected the splinter of silver in the lens, which caused a traumatic cataract. I explained that the lens and silver would have to come out at the same time, and as the boy was too young for a Smith operation, the eye would have to remain blind until the cataract would ripen. I then left for a six weeks' course of study at the Mayo clinic and to Chicago, stating that the operation could hold over until my return. It seemed that the bright silver caused the least disturbance of any foreign body I had ever seen in the eye. This being my first case of silver in the eye, and the boy being too young for a Smith operation, I was forced to await the ripening.

XXI.

DACRYOCYSTITIS CAUSED BY A MEMBRANOUS CLOSURE OF THE NASAL DUCT.*

MEYER WIENER, M. D., AND WM. E. SAUER, M. D.,

ST. LOUIS.

DR. WIENER: The importance of insisting on a thorough and careful examination of the nasal end of the tear duct is emphasized by the cases here reported. I well know that the thought is ever uppermost with the majority of practicing ophthalmologists of the existence of a close relationship between lacrimal obstructions and inflammation of the nasal mucous membrane, but I also believe, as the appended cases will show, that sufficient care is not always taken in determining the exact cause of obstruction of the tear duct.

CASE 1.—Mrs. A. D., seventy years of age, native American, consulted me on October 19, 1905, for a mucocele of the right sac, which she stated had been present for more than a year. Previous to that, however, she had been troubled with tearing for a period of several years. She had consulted several ophthalmologists, had been subjected to numerous probings and washings of the sac with little or no benefit. She insisted that she had no nasal catarrh, was not subject to colds and demonstrated that she could easily breathe through either nostril. I washed out the sac, but was unable to force any fluid through the nose, the solution regurgitating through the upper punctum. A No. 6 Bowman probe was easily passed through the duct to the nose.

It was with difficulty that she was persuaded to have an examination of the nose made; the report showed, however, no abnormality of the nasal cavity. At the instance of Dr. Sauer, another examination was made at his office with the

*Read before the Ophthalmic Section, St. Louis Medical Society, February 4, 1914.

probe introduced into the nose. A membranous obstruction prevented the probe point from entering the nasal cavity, although it could be distinctly felt and seen through this thin membranous obstruction. On October 26 the obstruction was removed by Dr. Sauer, after which fluid readily passed through the nose and the mucocele permanently disappeared. This patient was last seen by me January 30, 1911, and was at that time free from any apparent trouble with the lacrimal apparatus.

Case 2.—Mrs. B. O., fifty years of age, native German, consulted me July 10, 1913, suffering with chronic dacryocystitis of the right sac. She had had many months of treatment by various ophthalmologists, but had given up in despair, and had had no treatment for eighteen months previous to my examination. The last treatment had consisted of expressing the contents and the passing of Bowman probes. The physician had sent her to a rhinologist, but the report came to him that the nose was in perfect condition. I also experienced some difficulty in having another examination made in this case, but succeeded in persuading the patient to be examined with the introduced probe, which examination was made August 1, 1913. A No. 4 Bowman probe slipped easily down into the nose. Examination of the nose showed that here also the free exit of the probe was prevented by the presence of a thin membrane covering the opening of the duct; this obstruction was slit on August 14, after which time the pus from the sac drained through the nose. This opening soon closed, however, necessitating an excision of the membrane about four weeks later. The patient has been free from accumulation of pus in the sac and also from excessive tearing for the last month.

I wish to lay particular stress upon the importance of the nasal examination being made with the probe being introduced. This can be done by the ophthalmologist himself, or by the nose specialist if he is practiced in the art. And there are some who are quite proficient.

In a search through the literature, de Schweinitz is the only authority that I have been able to find who described a similar condition and emphasizes the necessity of exposing the lower entrance of the nasal duct into the inferior meatus by means of the nasal speculum, after the probe had been introduced.

DR. SAUER. As stated by Dr. Wiener, a pathologic condition of the lacrimal canal may exist at its nasal orifice which cannot be detected by the ordinary methods of rhinoscopic examination. The opening of the duct is high up under the inferior turbinate and can be seen only with a Holmès' pharyngoscope, or when a part of the turbinate is removed. It is, therefore, necessary to pass a Bowman probe from above in order to locate the point of obstruction. In the cases reported by Dr. Wiener this was done. A part of the inferior turbinate was removed. The end of the probe was then located in a pouch of mucous membrane. The movements of the probe within the sac could be seen through the nose. The sac was then removed and the probe passed readily into the nose. A few probings were required to maintain this opening.

At various times attempts have been made to probe the nasal duct from its nasal orifice. La Forrest made the first attempt in 1730, but owing to the short distance between the opening of the duct and the floor of the nose, only a small portion of the canal could be reached. This method had been given up until Polyak resurrected it in 1902. He had a number of probes constructed with which he claimed to be able to dilate the lower portion of the canal, and reports three cases in which he succeeded in curing the epiphora. As far as I was able to learn, no one adopted his method. Caldwell made the first attempt to open the nasal duct through the nose in 1893.

In 1901 Passow described an operation in which, after introducing a Bowman probe from the lower punctum as far as possible, he introduced a punch forceps in the nose and removed the anterior end of the turbinate as well as the nasal wall of the lacrimal duct, until he reached the probe. He reports a number of successful cases. Eight years ago, Hyman of Berlin advocated fracturing and turning up the inferior turbinate in those cases where the obstruction was due to a turning outward and upward of the lower margin of the turbinate, especially in roomy nasal passages. When the passages were narrow he removed a part of the lower turbinate as well. Since Passow described his first operation, a number of rhinologists have advised various methods for securing a permanent opening of the canal. West, Polyak and Halle have each devised

an operation for opening the duct and sac through the nose; the principle involved is the same in all three, the difference being a slight variation in the technic. After incising the mucous membrane just in front of the insertion of the middle turbinate, making either a curved or rectangular incision, the mucous membrane is then elevated and the flap turned up out of the way. The nasal wall of the lacrimal duct is then chiseled away until the sac is reached, being careful not to injure the membranous canal. The membrane is then incised up as far as the sac, when the nasal wall of the sac is removed as in Toti's operation. Halle and West replace the flap of mucous membrane, leaving a free communication between the lacrimal sac and nose; Polyak removes this flap. West has done this operation in one hundred and thirty cases, and claims to have been successful in 90 per cent. In some of the cases an external operation had been performed, and in these cases the results were not satisfactory; Polyak had operated upon thirty-one cases with satisfactory results.

In December, 1911, Yankauer described an operation in which he makes a horizontal incision one-quarter inch in length, just in front of and above the anterior end of the middle turbinate. This incision is then carried down to the anterior end of the inferior turbinate when it is carried backward along the lower margin of the inferior turbinates for one-half inch or more; the mucous membrane is then elevated and the flap turned up. The mucous membrane below the inferior turbinate is also dissected away from the turbinate, leaving the bony portion of the turbinate exposed; this portion of the turbinate is then removed with a pair of forceps as far back as the opening of the lacrimal canal; the canal is then opened with a suitable forceps. The nasal wall of the entire bony canal is removed, after which an incision is made in the membranous canal as far up as the sac; this incision is made along the posterior wall of the canal and the flap is turned forward. The nasal wall of the lacrimal sac is removed with a pair of forceps, after which the mucous membrane of the nose is stitched back in place. The nose is packed for twenty-four hours, at the end of which time the pack is removed and the canal is irrigated from the upper punctum with a normal salt solution. This is kept up for several days. He has operated upon nine cases, with satisfactory results in eight.

In 1911, von Eichen devised an operation in which he opened the canal from the maxillary sinus. After opening the canal he removed a portion of the sac. Since that time he has modified his operation by entering the canal from the canine fossa, without opening the antrum; his operation is done under cocain anesthesia and he claims that the operation is easier and a better view of the work is obtained than when working intranasally.

ABSTRACTS FROM ENGLISH OPHTHALMIC LITERATURE.

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Report on Twenty-six Sclerocorneal Trephinations (Elliot's Operation) for Glaucoma.

REBER, WENDELL (*The Ophthalmoscope*, April and May, 1914). The article deals with the operative treatment of glaucoma, drawing a comparison between iridectomy and sclerocorneal trephining. Twenty-six cases operated after Elliot's method are reported in detail, with the conclusions drawn from the results.

The advantages of iridectomy as a complete and sufficient means for the control of the glaucoma process are classed as follows:

1. Ease of execution.
2. Short duration of the operation.
3. Prompt closure of the wound, leading to
4. Lessened liability to infection.

5. Freedom from complications in the healing (formation of synechiae).

6. Permanency of result.

The disadvantages may be summed up in the following complications at time of operation:

1. Transfixation of iris.

2. Widespread separation of the root of the iris.

3. Partial or complete dislocation of the lens.

4. Intraocular hemorrhage at the time of operation.

5. Unruly patient. Irreparable damage caused by struggling or movement at inopportune moment. Even general anesthesia not free from danger.

The following may be claimed for Elliot's sclerocorneal trephining:

1. It is relatively easy of performance.

2. It is less risky than von Graefe's or Lagrange's method.

3. It is reasonably promising of improvement or cure in both acute and chronic glaucoma.

The findings in the twenty-six eyes operated by Elliot's method in sixteen subjects are tabulated as follows:

In six eyes that were sightless, the seat of absolute glaucoma and in every way degenerated, the patients were rendered free from pain, and an eyeball that was cosmetically satisfactory was preserved to them. This is no small matter, as they were all the very type of eyes that are likely to develop explosive choroidal hemorrhages at the time of operation. Moreover, the teaching in many quarters is that in absolute glaucoma the safe measure is enucleation, an operation from which people instinctively shrink with horror. If trephining will preserve to such patients an eye that will be painless and quiet, it has on this premise alone proven its title as an acceptable operation.

In five other eyes that were sightless there was a small degree of vision gained by the operation, such as hand movements at from one to three feet.

In the remaining fifteen eyes the results were good in that the eyes gained considerably in vision and in usefulness. The greatest gain in vision after trephining was from 2/60 to 6/12. The least gain was from 5/12 to 5/10, but this gain was greater than appears on its face, for it was the patient's remaining eye, the fellow eye having been already blinded by

chronic simple glaucoma. Today (after one year) this patient's optic nerve excavation remains just what it was one year ago. His field of vision is enlarged and the cicatrix is filtering nicely; we are, therefore, justified in feeling that the usefulness of this eye will be preserved to him for many years, which, after all, is all that can be claimed for any glaucoma operation.

Operation is not advised in chronic simple glaucoma so long as the patient can be kept in the enjoyment of reading vision by the use of miotics and general treatment, with a fair sized visual field and not too marked an excavation of the nerve head.

The writer has drawn the following lessons from his experience in these twenty-six operations:

The first and most important is that we now approach a glaucomatous eye from the surgical standpoint, with a hopefulness that we have never enjoyed up to this time.

The second lesson is that the operation, while not so brilliant and perhaps more tedious in performance than iridectomy, nevertheless is much safer as an operation.

The third lesson is that one must expect a much longer postoperative reaction after trephining than after iridectomy, which does not alter the usual channels of circulation in the eye, while the very essence of sclerocorneal trephining is that it provides a subconjunctival escape for the lymph that has been blocked in the anterior ocular segment. Gradually the eye becomes adapted to the new channel of filtration and the reaction subsides.

The fourth lesson is that, as Colonel Elliot has already pointed out, "quiet iritis" is not infrequent, and that the use of atropin in the eye from the second or third day onward for ten to twelve days is generally beneficial.

The fifth lesson, which has also been dwelt on by Colonel Elliot in his book, is that a large flap affords the best chance for the establishment of subconjunctival filtration. If the flap is made so as to bring both sides of the flap down to the limbus on either side, the cicatrix which forms is almost sure to interfere with subconjunctival filtration.

The sixth lesson is that if the conjunctival tissues are found thick and infiltrated it were wise to use a stitch.

The seventh lesson is that once the scissors have carried

the flap down to or near the limbus, the flap should not be held with any forceps, but is best held down with some cotton wrapped on a wooden applicator. This quite suffices to hold the flap down while the conjunctival layer of the cornea is being split off, and provides a mop in the operator's left hand for ready use.

The eighth lesson is that a clean sharp cut through the sclera is a great desideratum. For this purpose some straight tubular trephines are being made which may be used attached to a small flexible shaft attached to a tiny eight ounce motor. All trephines should be carefully cleaned and lubricated after using.

The ninth lesson is that one can hardly split off the conjunctival layer of the cornea too far forward to facilitate accurate placement of the trephine. Descemet's membrane must be cut through if possible, and we believe this is much more likely to occur if a mechanically operated rapidly rotating trephine is used than if a hand trephine is employed.

The tenth lesson is that a 2 mm. trephining has proved more serviceable than a $1\frac{1}{2}$ mm. one.

The eleventh and final lesson is that intraocular hemorrhage will occur in a certain percentage of cases, seeing that the glaucomatous eye is almost always a vascularly degenerated eye. In the presence of trephining this is an almost negligible factor, so far as the integrity of the eyeball is concerned, a claim that even the most ardent advocate of iridectomy cannot advance for the operation.

It is, therefore, our feeling that sclerocorneal trephining (sclerostomy) has come to stay; that it is by all odds the safest operation for glaucoma in the hands of the neophyte; that if this postulate is correct, many more prophylactic operations for glaucoma may be done now than have been done in the past.

W. R. P.

The Levator Palpebrae Superioris Muscle: The Attachments and Relations of Its Aponeurosis.

WHITALL, S. E. (*The Ophthalmoscope*, May, 1914). A concise description of the levator palpebrae superioris muscle is given, especially as to its aponeurosis. The essential features of the article are summarized as follows: The levator of the upper eyelid arises from the bone just above the optic

foramen at the apex of the orbit and passes forward towards the base, where the fleshy belly of the muscle terminates in its expanded tendon or aponeurosis. This is a band of dense connective tissue which stretches transversely across the base of the orbit just behind its upper margin, arching over the globe of the eye from side to side. From the anterior edge of the band connecting strands of tissue pass forwards to the eyelid, whilst its extremities are anchored to the margins of the orbit opposite the medial and lateral canthi. In shape and mode of action the aponeurosis may to a certain extent be likened to the vizor of a helmet; it is swung backwards over the globe by contraction of the muscle, its anterior connections pulling the eyelid with it and so forming the superior palpebral fold of the skin.

The expanded tendon or aponeurosis of the levator palpebrae superioris muscle has both palpebral and orbital attachments. By the former it is connected to the skin and face of the tarsal plate of the upper eyelid by numerous slender fibers which radiate forwards from its anterior edge. In exposing the tarsal plate from the front, these fibers are condensed by dissection into a layer of connective tissue which intervenes between the orbicularis oculi muscle and the plate. By its extremities the aponeurosis is anchored to the margins of the orbit opposite the medial and lateral canthi. The lateral extremity is much the stronger, and in the form of a ligamentous band cuts into and is firmly attached to the lacrimal gland; it is continued on to be fixed to the tubercle on the malar bone just within the orbital margin opposite the lateral canthus. From the position of this band it appears well adapted not only to maintain the lacrimal gland in place, but also to impart some movement to it; an action which may be assisted, sometimes by the presence of lateral offshoots from the belly of the muscle itself to the gland. On the medial side the aponeurosis loses abruptly its tendinous nature as it passes across and comes into close contact with the reflected tendon of the superior oblique muscle. From this point it can be traced with difficulty towards the medial palpebral ligament in the form of loose strands of connective tissue. This extremity of the aponeurosis, with the orbital margin on the inner side and the tendon of the superior oblique muscle above, demarks a triangular space in the upper inner region of the orbit;

through this space the orbital fat bulges when the overlying orbicularis oculi muscle has lost its tone, and thus there is formed the swelling in the inner corner of the upper eyelid so often seen in the aged. W. R. P.

Studies on the Nature and Treatment of Pterygia.

McREYNOLDS, JOHN O. (*The Ophthalmoscope*, March, 1914). A communication was addressed to one hundred of the leading ophthalmologists of America, requesting their views on fourteen questions relative to the nature and management of pterygia, and the results of this investigation and the author's personal experience are set forth.

The questions asked are as follows:

1. Approximately, what proportion of your ophthalmic patients are affected with pterygia?
2. What is your view of the causation of pterygia?
3. What has been your observation with regard to the influence of age, sex, climate, and occupation on the primary production or recurrence of the growth?
4. What relation do you discover between pinguecula and pterygium?
5. What relation do you discover between corneal ulceration and pterygium?
6. What is your view of the pathology of pterygium?
7. From what different directions have you observed the growth advancing over the cornea?
8. To what extent have you observed the cornea covered by pterygia?
9. What effect on vision have you observed other than that produced by obstruction of light?
10. Have you observed any effect on the motility of the eyeballs before operation and after operation?
11. Have you observed a cure from any treatment other than operation?
12. What methods of operation have you employed, and with what results?
13. If the method which you generally employ is satisfactory, state the special advantages of the same.
14. If the method which you generally employ is not satisfactory, state the objections which you have encountered.

Considering the nature of the growth and the circumstances

under which it develops, the writer has concluded from his experience that pterygia are produced by the prolonged irritating action of several factors, chief among which are heat, a dry atmosphere, high winds, exposure to sunlight, and an abundance of dust, especially if alkaline in character.

The McReynolds operation is a modification of the old transplantation method of Desmarres, but differs from it and also from Knapp's operation in some important features.

The details of the operation are the following: (1) Grasp completely the neck of the pterygium with strong but narrow fixation forceps. (2) Pass a Graefe knife through the constriction and as close to the globe as possible, and then, with the cutting edge turned towards the cornea, shave off every particle of the growth smoothly from the cornea. (3) With the fixation forceps still holding the pterygium, with slender straight scissors divide the conjunctiva and subconjunctival tissue along the lower margin of the pterygium, commencing at its neck and extending towards the canthus, a distance of one-fourth to one-half of an inch. (4) Still hold the pterygium with the forceps and separate the body of the growth from the sclera with any small noncutting instrument. (5) Now separate well from the sclera the conjunctiva lying below the oblique incision made with the scissors. (6) Take black silk thread armed at each end with small curved needles and carry both of these needles through the apex of the pterygium from within outwards and separated from each other by a sufficient amount of the growth to secure a firm hold. (7) Then carry these needles downward beneath the loosened conjunctiva lying below the oblique incision made by the scissors. The needles, after passing in parallel directions beneath the loosened lower segment of the conjunctiva until they reach the region of the lower fornix, should then emerge from beneath the conjunctiva at a distance of about one-eighth of an inch from each other. (8) Now, with the forceps lift up the loosened lower segment of conjunctiva and gently exert traction upon the free ends of the threads which have emerged from below, and the pterygium will glide beneath the loosened lower segment of the conjunctiva, and the threads may then be tightened and tied and the surplus portions of thread cut off, leaving enough to facilitate the removal of the threads after proper union has occurred.

A clean field of operation is desirable, as in all ophthalmic operations, but a low grade of chronic conjunctivitis is not a contraindication, and infection is extremely rare. Anesthesia is obtained by instillation of cocain, unless the growth is very thick and fleshy, when a few crystals of cocain hydrochlorid are applied directly to the head and neck of the pterygium. The judicious use of adrenalin is advocated.

McReynolds has devised a forceps for lifting the growth freely from the underlying sclera, which may also be used as a needle holder. A special pterygium knife is employed, resembling a narrow angular keratome, which may be introduced with equal facility on either side of either eye by the operator and a cut made in any desired direction. It is essential that the growth be removed completely from the cornea. The growth, if fully developed, involves not only the epithelial layer and Bowman's membrane, but also the superficial lamellæ of the corneal stroma. For this reason all forms of divulsion and ablation by means of dull instruments must fall short of the highest efficiency. For the separation of the body of the growth from the underlying sclera the point of the closed Stevens strabismus scissors is used. The conjunctiva must be thoroughly undermined above the growth, and all fibers in the immediate vicinity of the neck should be freed from their attachments at the limbus.

For the suture material fine black silk thread has been most satisfactory. The sutures should be so directed and the tension so regulated that the normal conjunctiva above the growth shall be made to curve accurately around the denuded limbus, without encroaching upon the cornea or without leaving any portion of the sclera uncovered.

W. R. P.

Metastatic Gonorrheal Conjunctivitis With Keratitis and Iritis— Two Cases.

MCKEE, HANFORD (*The Ophthalmoscope*, March, 1914). The literature of metastatic gonorrheal conjunctivitis is reviewed from the earliest date. Two cases are reported, both of undoubted endogenous origin.

Case 1.—Male, aged twenty-four years, with acute urethritis of two and one-half weeks' standing, accompanied by arthritis. Both eyes showed a severe purulent conjunctivitis with profuse discharge and marked conjunctival congestion. The con-

dition cleared after a mild course under boric acid irrigations. Two mild recurrent attacks occurred during the next two weeks. The rheumatism ran a protracted course.

Bacteriologic examination showed Gram negative diplococci, but nowhere as plentiful as in the exogenous form. Cultures showed large Gram positive cocci and small Gram negative diplococci.

Three months later patient developed an iritis in both eyes which cleared under vaccine therapy. The patient's previous history is interesting in this respect, that during the previous year he had been in the hospital with systemic gonorrhea, and during that attack had a metastatic conjunctivitis with scleritis. He had had a chronic gonorrhea for a year, when rheumatism and inflammation of the eyes set in simultaneously with the cessation of the urethral discharge.

Case 2.—Male, aged thirty-nine years, confined in bed with an active gonorrheal urethritis complicated by arthritis and pericarditis. Examination showed a severe conjunctivitis on the right side with purulent discharge. Two days later the left eye became involved. Bacteriologic examination was entirely negative. Ten days later the conjunctivæ were normal, but in each cornea were grouped points of infiltration. This was followed two days later by a very definite iritis in each eye, with posterior synechiæ on the left side. With atropin and hot fomentations the corneal condition cleared up quickly and the iritis gradually subsided.

W. R. P.

The Operative Treatment of Conical Cornea.

ADAMS, P. H. (*The Ophthalmoscope*, March, 1914). The question of the operative treatment of conical cornea is discussed, especially as to stage when operation is advisable and as to prognosis.

The last twenty cases operated at Oxford, with the electric cautery applied either to the apex of the cone or just below it without perforation, showed improvement in vision from 6/60 or less to 6/30 to 6/9.

In order to keep the tension low during the process of healing, Elliot's trephine operation was added to the procedure in the last eight cases, which are briefly summarized.

While it is not suggested that all cases of conical cornea which require operation should necessarily be trephined, it is

regarded as a useful procedure in severe cases. It is reasonable to suppose, in the absence of knowledge of the actual cause of the condition, that the weakened corneal tissue has been unable to withstand the normal intraocular pressure with consequent bulging. The operation described not only replaces the weakened and yielding corneal tissue by a firm scar, but at the same time ensures that this scar shall have every opportunity of solidifying under the most favorable conditions.

W. R. P.

Eye Injuries From Eyeglasses.

LAUBER, HANS (*The Ophthalmoscope*, April, 1914). From a review of the literature and his own personal experience, which comprises a survey of over 150,000 patients, the author concludes that injuries from broken eyeglasses are very rare.

Amongst this number of 150 patients, there occurred five cases of lesions from broken eyeglasses, i. e., one in 30,000 cases.

Case 1.—Sudden stoppage of a train hurled the patient, a man, against the wall, breaking his eyeglasses. A splinter of glass penetrated the left eye, which he extracted himself. Examination the following day showed blood clots in vitreous. In the extreme periphery of the inferior nasal part of the fundus a white area was seen, sharply outlined by a red margin. A white stripe ran in an equatorial direction from this area, and fold-like light areas were seen in the neighborhood. A small perforation of the coats corresponded to the fundus lesion. X-ray and surgical investigation were negative. Six weeks later the retina was detached at site of injury and vision reduced to light perception.

Case 2.—Injury from glass of spectacles shattered by explosion of an acetylene lamp. Examination showed, in addition to lid wounds, a linear wound of the inferior nasal quadrant of the cornea 4 mm. long and extending 6 mm. into the sclerotic. Uveal and vitreous tissue incarcerated in wound. It later became necessary to enucleate the eye upon the development of an iridocyclitis, for fear of sympathetic ophthalmia.

Case 3.—Eyeglass splintered by metal wardrobe number, causing a linear wound across temporal two-thirds of cornea of left eye. Iris was jammed in the wound below for 5 mm., but not prolapsed. Lens opaque. Some time later a large splinter of glass was seen behind the iris and removed with

Graefe knife and forceps. The size of the splinter was 9.2x9.3x1.3 mm. Vision S. + 10.00 equaled 0.3.

Case 4.—Glasses shattered by baseball, causing central wound of cornea 3 mm. long, to which a thin tag of iris was adherent. A small particle of glass was seen in the anterior chamber, the tip directed toward the iris and apparently penetrating it. The particle was extracted and the piece of iris excised. Three small blebs subsequently appeared in the inferior nasal quadrant of the cornea containing tiny particles of glass. Removal allowed a favorable recovery. Vision 0.1.

Case 5.—Patient struck by flying hoof of a pig which was being butchered, shattering right lens of spectacles. Examination revealed several linear scars, between them a small particle of glass. Lens opaque, posterior synechiae on nasal side. Lens substance evacuated by corneal puncture and piece of iris excised. Smooth recovery.

Spectacles, it seems, are more dangerous than eyeglasses, probably because the latter drop off much more easily. Framed eyeglasses are probably the safest way of wearing glasses under the usual conditions of life.

W. R. P.

Decompression in Glaucoma.

YOUNG, GEORGE (*The Ophthalmoscope*, April, 1914). The author describes in detail a new method of scleral trephining for glaucoma, which he performed in a case of absolute glaucoma two years ago, the striking result in which has persisted without relapse.

A rabbit's eye was trephined behind the anterior scleral ring, leaving no communication between anterior chamber and trephine hole. Copious suffusion of the conjunctiva appeared rapidly, tension dropped considerably, but not a trace of fluorescein injected into the anterior chamber could be found in the fluid coming through the trephine hole.

With the idea that hypertension could be reduced without necessarily opening the anterior chamber or touching the uvea, and that the true cause of success could always be attributed to the sclera, the following operation was devised: A large flap concentric with the limbus is dissected with closed scissors from above down to its attachment at the limbus, of which 1 cm. is exposed. Two symmetrical discs of sclera, about 6 mm. apart and separated from the corneal margin by a nar-

row strip of sclera. The corneal tissue is not touched and no iridectomy is performed. The scleral discs are removed by a 1.5 mm. trephine, first fixing them with a small sharp hook, specially devised for the purpose. Three sutures are introduced, two lateral ones first, placed at such points as to draw the flap away from the holes.

The tension in the case operated was promptly relieved and has never returned or varied; frequent tonometric readings are from 15 mm. to 20 mm. Hg. No miotic was used. Vision, which was nil before operation, was not improved.

A description of the instruments used is given with drawings illustrating their construction and method of use.

W. R. P.

"Struma" an Important Factor in Diseases of the Eye.

BUTLER, T. HARRISON (*British Medical Journal*, October 18, 1913), points out that the expression "struma" was really only another name for attenuated tuberculosis, and thus it is, as it has always been, an important factor in a large number of eye diseases. He considers the von Pirquet reaction too delicate and uses as an initial dose .001 cc. of old tuberculin. He does not regard the local reaction around the site of the injection as a matter of very great importance. Among the diseases caused by attenuated tuberculosis are phlyctenular ophthalmia, cyclitis, choroiditis, scleritis, interstitial keratitis, iritis; in speaking of iritis, he emphasizes his contention that a certain proportion of the so-called rheumatic type is really due to attenuated tuberculosis, whether by direct infection or toxemia.

E. S. T.

Supercorneal Sutures and an Operation for Conical Cornea.

MADDOX, ERNEST E. (*British Medical Journal*, November 1, 1913), uses the term "supercorneal" to designate such sutures as may be laid immediately in contact with the cornea in securing the proper position for a conjunctival flap. He finds that such sutures are well borne, provided that the following simple rules be adhered to: (1) To let no knot come near the cornea; (2) no threads cross each other; and (3) none be used too thin or too tight. Nature, by covering such threads with protective mucus, teaches us to anoint or wax them ourselves. Several methods of using the Kuhnt flap are discussed. In

operating for conical cornea he excises the summit of the cone, as advised by Bader, and then draws the flap over the cornea so that its tension may act at right angles to the gap, thus not only drawing its lips together mechanically, but closing the anterior chamber and preventing sepsis. E. S. T.

The History of the Invention and Discovery of Spectacles.

OLIVER, GEO. H. (*British Medical Journal*, October 25, 1913). This article, which cannot satisfactorily be dealt with as an abstract, is a very careful review of the evidence bearing on the use of magnifying devices by the ancients, and the invention of glasses by Salvino D'Amato in 1285, down to their manufacture in the early part of the nineteenth century. It is an article which will well repay a careful reading.

E. S. T.

Two Cases of Ocular Disease Associated With Pyorrhea Alveolaris.

TIBBLES, SYDNEY G. (*British Medical Journal*, April 4, 1914). The first case, aged twenty-three years, had an extensive choroiditis with some slight haze in the vitreous. The mouth was in a bad state, the gums very unhealthy, while the teeth were carious and broken down. He was advised to have appropriate dental treatment at once, and was given mercury and potassium iodid internally. Two months later the vision had improved from 6/24 to 6/9.

The second case was a woman of forty-six years, who had an iridocyclitis in her right eye. Gums and teeth were in bad condition. Pus oozed up from the sockets of the teeth, which were practically all carious. Appropriate dental treatment was followed by an immediate improvement, and two months later vision in the eye had improved from 6/36 to 6/12.

E. S. T.

The Experiences of Surgeons in Sclerocorneal Trephining.

ELLIOT, R. H. (*British Medical Journal*, April 25, 1914). gives a brief resumé of certain of the published results of trephining at the hands of several surgeons. Testimony so far has been favorable and the results encouraging. As these papers have already been abstracted in the original, it is unnecessary to recount them.

E. S. T.

Binasal Hemianopsia Occurring in the Course of Tabetic Optic Atrophy.

REED, CHAS. R., AND PRICE, GEO. E. (*Journal A. M. A.*, March 7, 1914). Binasal hemianopsia is a rare symptom, and it is generally accepted that it can be produced by a single lesion. The analysis of the recorded cases show that in the majority of instances it results from more or less symmetrical lesions of the optic nerves. Twenty-one cases, including the present, have been reported. The present case, a man aged forty-eight years, applied for treatment April 3, 1912, complaining of slowly failing vision. His vision was: right, 4/60; left, 6/60; both optic nerves presented a decided atrophy. Hysteric stigmata were absent, but there was a slight Romberg sign, Biernacki's sign, loss of the Achilles tendon reflex, and lymphocytosis of the cerebrospinal fluid. E. S. T.

Ophthalmoplegic Migraine.

BRAY, AARON (*Journal A. M. A.*, March 14, 1914), reports a case of recurrent paralysis of the right external rectus muscle following parturition. The patient, a woman of thirty-five years, gave a history of a severe attack of headache following the birth of her first child. This headache was confined to the right side of the head, and lasted about two weeks. When the headache began to subside she became dizzy and saw double. This lasted for about six weeks, when the diplopia disappeared and she was well again. The patient was free from any further attack until the next childbirth, which came a year later. She was again free from migraine until her third child was born, again a year later, upon which occasion there was another attack of hemicrania, but no diplopia. Three weeks before she applied for treatment she had given birth to a fourth child. Another attack of great severity followed, and numerous styes appeared, and the right abducens was found paralyzed. The condition subsided under treatment. The author believes it possible that some toxemia of pregnancy is responsible for the condition. E. S. T.

Voluntary Displacement of the Eye.

KIMBALL, ARTHUR H. (*Journal A. M. A.*, April 4, 1914). The case reported, which is certainly unique, is of an inmate of the government hospital for the insane. He entered the

army in 1906, but began to show mental defects, and finally was admitted in April, 1909, with dementia precox—30 years of age. About six or seven months ago he began to devote his attention to his left eye, and by pushing the index finger behind the eyeball, the conjunctiva and muscles were gradually stretched until he was able to force the globe out of the socket. To do this seemed to afford him a certain amount of satisfaction. When the finger was removed from below the eye, the globe, by action of the muscles, was drawn back into the socket. There was complete atrophy of the optic nerve, but no other lesions. The manipulation of the eye seemed to cause him not the slightest pain or inconvenience. Three photographs are given.

E. S. T.

Sporotrichosis of the Eye.

WILDER, W. M. H. (*Journal A. M. A.*, April 11, 1914). In 1898 Schenck published a report of his studies of an organism that he had discovered in the pus from refractory subcutaneous abscesses of the eye. These organisms under cultivation showed characteristics similar to those of the yeasts and fungi. Dr. E. F. Smith of the United States Department of Agriculture tentatively assigned it to the genus *sporotrichum*. The organism was still further studied in 1900 by Hektoen and Perkins, and since then many cases have been reported. The first case of involvement of the eye was reported by Gifford in 1910, the author's case being the second.

The patient, a student, had been working in the laboratory with cultures of various strains of *sporothrix*, and on several occasions small capillary pipets containing emulsion of the organism were broken at a distance of eight or ten inches from the face. He finally noticed a soreness of both eyes, together with photophobia, and a sensation as if a foreign body was under the lids. The following morning the lids were slightly swollen, the pain was increased, and the surrounding lymph glands were quite tender on pressure. The conjunctiva was reddened and swollen, and there were numerous follicles and shallow ulcers. There was later a slight rise of temperature; finally *sporothrix* was obtained from the conjunctival scrapings. In two weeks the acute symptoms subsided, but the subconjunctival tissue of the fornices remained swollen for some days, and did not become perfectly normal for about

two months. The cultural examinations and opsonic tests are given in detail, and the authors give a very interesting resumé of sixteen cases reported previous to their own, of which fifteen were by foreign authors. Attention is called to the similarity of this disease with Parinaud's conjunctivitis, which is, however, a much more severe glandular infection, and has so far shown no specific organism. The presence of Gram positive, spore-like bodies in a direct smear from the conjunctiva should suggest sporothrix.

E. S. T.

Reclination in Tremulous Cataracts.

OBARRIO, P. DE (*San Francisco Jour. of Ophthal. and Oto-Laryngology*, Vol. VIII, No. 3), says that a tremulous iris is pathognomonic of a fluid vitreous, and that fluid vitreous can exist without a tremulous iris only when the solution of continuity of the suspensory ligament is so small that the remainder of the suspensory ligament is sufficient to hold the lens in place. An operator who attempts to remove a tremulous cataract then is more than likely to have a considerable loss of vitreous, probably prolapse of iris, and possibly lose the eye. In such cases de Obarrio has resorted to reclination of the lens. He says that the lens in the vitreous chamber does not cause a reaction which endangers the other eye. He has proved by experiment on animal eyes and by observation of human eyes that the suspensory ligament is friable in opaque lenses, and strong in clear lenses.

He then gives in detail his method of preparing the patient and the operator for the operation. He follows closely the preoperative technic of Prof. Panas.

As to the operation, he does not approve of the older method of incising the sclerotic posterior to the ciliary region. He makes a small incision through the external sclerocorneal margin, introduces a medium sized strabismus hook through this and breaks the zonular fibers above and to both sides of the lens, pushing the lens backward and downward into the vitreous. The hook is then removed and the iris is replaced as usual. He then applies a binocular starch bandage from four to six days.

De Barrio has performed this operation in eight cases, and finds about the same amount of reaction as one would expect

in an uncomplicated lens extraction. The vision, except in one case of wound of the cornea, has been as good as 20/30 +.

E. C. E.

A Case of Glaucoma Caused by Tuberculous Scleritis With Keratitis, and Relieved by Treatment With Tuberculin.

CHARLES, J. W. (*Amer. Jour. of Ophthal.*, Vol. XXXI, No. 3), reports a case of glaucoma caused by tuberculous scleritis with keratitis, which was relieved by treatment with tuberculin. The patient gives a very interesting detailed account of her illness. She was delicate from birth, had chronic discharging ears in her childhood, laryngitis and bronchitis in her youth, some pulmonary trouble in her young womanhood, and repeated attacks of episcleritis after her twentieth year. In her forty-sixth year she had an attack of sclerokeratitis in her left eye, which was followed by acute glaucoma. At this time she had two iridectomies and an anterior sclerotomy. She was then given antisyphilitic treatment. Dr. Charles saw the patient first in her forty-eighth year in an attack of scleritis with keratitis in left eye. At that time the disc was pale and showed very little cupping, the tension was 37 mm. (Schiotz). Vision, left eye, light perception. Pilocarpin, muriate was prescribed. A thorough laboratory examination was made. The Wassermann was negative, von Pirquet very positive, urinary and blood finding not such as to have any bearing on the case. The patient was treated with miotics for two weeks and showed much improvement, vision at this time being 1/2 with glasses. The patient was then given an injection of old tuberculin (3.00 mg.), with marked local, general and focal reaction. Two weeks later therapeutic injections of albumose-free old tuberculin were given every fourth day, with slight reaction. After most of the injections the only reaction noticeable was a slight clouding of the aqueous and vitreous. After about twenty injections the patient was discharged apparently well. Vision, left eye, 19/15 with stenopeic hole. Tension, 18.7 mm.

E. C. E.

Simple and Multiple Papillomata of the Conjunctiva.

LUEDDE, W. H. (*Amer. Jour. of Ophthal.*, Vol. XXXI, No. 3), mentions the rarity of papillomata in the conjunctiva, and reports two cases. Clinically the differentiation from epithe-

lioma is difficult, one differential point being the mobility of the papilloma. The diagnosis is made certain by histologic examination of a section.

Case 1 had a simple papilloma at the inner canthus of the left eye. Case 2 had seven papillomata in the left eye, two on the ocular conjunctiva and the others on the palpebral conjunctiva and in the lower fornix.

In both cases the papillomata were removed by simple excision under cocain anesthesia, with good results and no sign of recurrence.

E. C. E.

Fourth Series of Cases of Injuries From Foreign Bodies Examined by the Roentgen Rays, With Results of Operation.

SWEET, W. M. M. (*Ophthalmology*, Vol. X, No. 2). This series makes a total of 982 cases of foreign body in the eyeball reported by Sweet. The tables will repay study in the original, and for the purposes of an abstract the results are best summarized in the following table:

	First Series.	Second Series.	Third Series.	Fourth Series.
Eyeballs Enucleated—				
Extraction not attempted or failed	14	23	19	45
Extraction successful—enucleation later.....	10	28	39	20
Eyeballs Saved—				
No operation attempted.....	7	11	4	5
Extraction failed	2	4	9	7
Bodies in eyelid or orbit.....	4	9	17	23
Extraction Successful—				
Vision 6/12 or better.....	7	20	17	20
Vision 6/15 to 6/60.....	4	13	11	16
Fingers or hand movements, etc.	0	7	12	5
Good light projection.....	9	27	15	17
Light perception	6	21	9	15
No light perception—eye normal size	0	6	2	5
Eyeballs shrunk	2	4	3	7
No bodies shown by X-rays.....	37	145	125	95
Total.....	102	318	282	280

E. C. E.

Report of Twenty Cases of Trephining for Glaucoma.

REMMEN, NILS (*Ophthalmology*, Vol. X, No. 2), reports twenty cases in which trephining was done for the relief of glaucoma. In no case did infection occur, and in no case did vision become worse after the operation. Tension was sat-

isfactorily reduced in all but two cases. One patient was relieved by trephining after two iridectomies had failed. Remmen does not operate if other means will keep the tension down to normal.

E. C. E.

Adenoids as a Factor in Amblyopia.

ADAMS, CHAS. FRANKLIN (*Ophthalmology*, Vol. X, No. 2), makes reference to the association of sinus disease with diseases of the optic nerve, and cites some illustrative cases. He then goes a step further, and advances the idea that the cause of the sinusitis (adenoids) is also frequently the cause of disturbance in the ocular function, and that when they are removed in children vision is often improved. A table of sixteen cases is appended in which vision improved, frequently to a very marked degree.

E. C. E.

New Plastic Operation for Entropion.

TIFFANY, FLAVEL B. (*Ophthalmology*, Vol. X, No. 2), describes his operation as follows: "It consists of grafting a strip of skin from the lid into the intramarginal space, thus widening the space and wedging all the lashes away from the eyeball. It matters not which lid is operated on, as the technic of the operation is practically the same for either the superior or the inferior.

"I make an incision from near the punctum to the outer canthus, parallel to and about 2 mm. from the margin of the lid. I then make a second incision parallel to and about 3 mm. from the first incision, making the strip a little wider than the normal intramarginal space. I dissect up the narrow strip, freeing it from all areolar tissue, but leaving it attached at either end. With the keratome I then slit the intermarginal space at the conjunctival or mucous line, from the punctum to the outer canthus, going deep into the tarsus, and taking care to embrace all the lashes with the hair bulbs in the superior flap. The hemorrhage having been well checked, I divide the strip of skin in the middle, and then with the keratome I make near either pedicle an opening into the slot.

"Through these small openings I draw the free ends of the skin graft and place them in the slot, first taking care to free

the graft from all adipose or areolar tissue. If there is much redundancy of skin, and the strips are too long, I shorten them to the desired length and join the two ends by a catgut suture. This is the only suture that I use in the grafts. If the hemorrhage has been thoroughly checked and the skin is placed smoothly in the slot, there is no occasion for any further sutures either in the graft or in the slot.

"The advantage of this operation over any previous operation is that we have a living pedicle at each end, and the graft is secured in the slot or groove merely by one suture, and that confined entirely to the graft. If the operation is carefully and accurately done it will not only correct entropion, but any trichiasis or distichiasis as well, effecting a permanent cure and in many cases improving the appearance of the lid."

E. C. E.

The Asthenopia of Muscular Imbalance.

HANSELL, HOWARD F. (*Ophthalmology*, Vol. X, No. 2), says that heterophoria is, as is well known, in most cases dependent upon ametropia, and usually requires no other treatment than a correction of the refraction and use of the eyes under proper conditions. The article is a discussion of the well known facts in regard to the subject, and a suggestion that prisms often relieve the symptoms.

E. C. E.

Industrial Electricity as a Cause of Cataract.

LAUDER, EDWARD (*Ophthalmology*, Vol. X, No. 2), reports the following case: "R. R., male, aged twenty-two years, had walked some distance in a rain on the morning of April 9, 1908, to a waiting place for an electric car. In a part of the building adjoining the waiting room were two transformers used for stepping a direct current from 22,000 volts to 1,000 volts. The door to this part of the building being open and no one on guard, and not knowing the danger, the young man approached the transformers so that the heat from them would dry his wet clothes. Suddenly he received a shock rendering him unconscious, and he fell backward on the wires connecting the two transformers. How long he remained in that position I was unable to learn. As a direct result of this contact he received a burn of the third degree on the left buttock. The skin of the eyelids was also burned and the eyebrows and eyelashes singed. In July, 1908, the right eye

began to give him annoyance. It was inflamed and very sensitive to light. A week later the left eye began to cause similar trouble. At the time I first saw him, fourteen months after the accident, his vision was:

O. D., 20/40 (part), with $+ 1.00 \text{ } \overline{\text{C}} \text{ } + 0.75 \text{ cyl. axis } 95^\circ = 20/40$.

O. S., 20/40 (part), with $+ 0.50 \text{ } \overline{\text{C}} \text{ } + 0.75 \text{ cyl. axis } 95^\circ = 20/20 \text{ (part)}$.

The pupils were normal and active. There was neither ciliary nor conjunctival congestion. Both lenses showed opacities, the right being worse than the left. Near the vertical meridian and in the superior nasal quadrant of the right lens was a definite opacity about 2 mm. in length and 1 mm. in breadth. Scattered throughout the lens were a number of fine dust-like opacities. The left lens showed a number of fine dust-like opacities obstructing a section of about one-quarter the area of the lens, on the nasal side, extending both above and below the horizontal meridian. All the opacities in both lenses appeared to be immediately beneath the anterior capsule. When I last saw this patient on February 8, 1910, his vision in the right eye was 20/200 and in the left 20/30, thus showing marked progress toward total opacity in the right eye during eight months."

Seven cases are collected from the literature, and the occurrence of cataract is ascribed to the effect of the current on the cells of the lens, since electricity has a well known affinity for the epithelial elements.

E. C. E.

The Newer Operations for Acute and Chronic Glaucoma.

FOX, L. WEBSTER (*Ophthalmology*, Vol. X, No. 2), describes the various operations for glaucoma, beginning with de Wecker's efforts in 1901 to produce a filtering cicatrix by leaving the iris incarcerated in the wound, with reference to Herbert's isolation wedge operation, the same operation with Bishop Harman's twin scissors, cyclodialysis, Lagrange's sclerectomy, sclerocorneal trephining and other forms of sclerectomy. In acute glaucoma "it would appear that almost all ophthalmic surgeons are unanimous as to placing their reliance upon iridectomy." (Amen.) In chronic glaucoma he prefers trephining. He uses the von Hippel trephine, and dissects the flap of conjunctiva upward from the corneo-

scleral margin, instead of downward to it. In this he follows van Lint. After the operation the flap is drawn down over the trephine wound and fastened with one or more sutures.

E. C. E.

The Indian Operation for Cataract.

TIFFANY, F. B. (*Jour. of Ophthal. and Oto-Lary.*, Vol. VIII, No. 4), describes the Indian operation as he saw it done by Lieut. Col. Smith of Amritsar. Col. Smith makes a large incision in the cornea close to the limbus, the incision embracing nearly one-half the perimeter of the cornea. Then with the strabismus hook he presses on the lower periphery of the cornea and with gentle manipulation removes the lens within the capsule. He does not make an iridectomy except in complicated cases, but he stabs the iris near the ciliary border to prevent postoperative prolapse. Tiffany states that Col. Smith not infrequently loses vitreous, but that gives him little concern, as he believes the vitreous is restored. Col. Smith keeps his patients in bed for a week or ten days after the operation and does not dress the eye during this time unless there are untoward symptoms.

Aside from rinsing his instruments in carbolic acid solution and flushing the eye with a weak solution of bichlorid of mercury before and after the operation, Col. Smith did not take the ordinary precaution against infection. All patients were received, with their relatives and dogs, in the operating room. Col. Smith and his assistants, with the exception of the nurse, operated in business suits, and Col. Smith invariably smoked while operating.

Tiffany noticed a large percentage of eccentric pupils, in nearly every case the iris having healed in the wound. He does not think that the Indian operation will become generally popular.

He was very well impressed with Col. Maynard's clinic in Calcutta, and he states that Col. Maynard's operation for cataract more nearly approaches his ideal than any other he saw in the Orient.

E. C. E.

A Further Report on Parinaud's Conjunctivitis.

KEEPEE, GEORGE F., Lafayette (*Ophthalmic Record*, March, 1914), gives a general review of Parinaud's conjunctivitis, and shows photographs of two cases. He gives the pathologic

report of Prof. Alburger of one of his cases, which does not differ in any special degree from that found by others. He refers to the possible tuberculous etiology, and also to the work of Verhoeff, who in eleven cases has found a hitherto undescribed fungus. In the investigation of future cases it may be found that Parinaud's conjunctivitis represents several different types of disease.

As for treatment, Keiper recommends a solution of zinc phenolsulphonate, boric acid and water. Dry heat should be used for the swollen glands; internally, calomel and quinin. Where possible to excise the granulations, this should be done.

Bacteriologic examinations of his first case revealed a lepto-*thrix*. Examination of the second case was negative.

G. S. D.

An Unusual Complicated Case of Sphenoidal Abscess Causing Amblyopia.

HARRIS, C. M., Johnstown (*Ophthalmic Record*, March, 1914). Patient had previously suffered a penetrating injury of right eye. For several weeks vision in left eye had been failing. No positive pathologic condition of this eye could be made out, and no careful fields were taken. Vision was reduced to 6/22.

The writer found purulent disease of the sphenoid sinus. The cavity was cleansed and drained. Vision improved slightly, becoming finally 6/15.

G. S. D.

A Set of New Lacrimal Probes.

WEIDLER, WALTER B., New York City (*Ophthalmic Record*, March, 1914), criticises the existing probes for the lack of a proper handle, and describes a probe which has been fitted with the regulation handle of an ophthalmologic instrument.

G. S. D.

A New Operation for Detached Retina.

TIFFANY, FLAVEL B., Kansas City (*Ophthalmic Record*, March, 1914), trephines the sclera in the central portion of the detachment with a small Elliot instrument. The protruding knuckle of choroid is seized and excised.

He reports a case where the operation was performed, and in which a considerable degree of sight had been recovered a week following.

G. S. D.

Report of Case of Steel Lodging in the Sclera.

KRIDER, EDWARD E., Oelwein (*Ophthalmic Record*, March, 1914). A small, narrow spicula of steel entering the eye became completely imbedded in the sclera of the posterior portion of the globe. G. S. D.

Shield for Graefe Cataract Knife and Angular Keratome.

LEWIS, F. PARK, Buffalo (*Ophthalmic Record*, March, 1914). This article contains a description of shields made to fit the ordinary cataract knife and keratome. They are made of aluminum, and are very light. Their virtue lies in protecting the edges and points of the instruments while carrying them in the case and during sterilization. G. S. D.

The Clinoscope as a Guide to Operative Eye Work, With an Example.

EATON, F. B., Portland (*Ophthalmic Record*, April, 1914). lauds the advantages of Stevens' clinoscope, and shows how a homemade instrument may be easily constructed. He describes Stevens' operation of extendocontraction of a rectus tendon controlled by use of the instrument. G. S. D.

The Operative Treatment of Muscular Imbalance.

McCOOL, JOSEPH L., Portland (*Ophthalmic Record*, April, 1914). The various muscle tests are described, and emphasis is laid on the necessity of determining the rotation of each eye with the Stevens' tropometer. The writer believes that no operation should be performed until the rotation of the eyes has been determined.

McCool uses the Worth advancement operation, with satisfactory results. For lesser defects he advises either the LaGleyze or Savage modified tendon tucking operation. Three cases are reported illustrating his results. G. S. D.

The Nature of Trachoma.

CRISP, WILLIAM H., Denver (*Ophthalmic Record*, April, 1914). This article represents the writer's thesis for the degree of doctor of ophthalmology.

It is possible that some day what we now call trachoma will be found to be merely a group of symptoms arising from

either of several distinct causes. A general discussion of the disease is given, and a careful description of one case in which the tarsal cartilage was excised. The disease was finally satisfactorily influenced by a submucons resection of the septum.

Crisp believes that the disease was markedly aggravated by nasal obstruction. G. S. D.

Treatment of Trachoma (Second Stage).

DEWEY, CHRISTIAN H., Washington (*Ophthalmic Record*, April, 1914). In this stage of the disease, stripping of the lids may be employed with success. It is very important that expression should be thorough; and to deal with the granules which cannot be removed by the ordinary forceps the writer has devised a trachoma bur with which the remaining granules may be removed. Operation is performed under local anesthesia.

The writer appends his instructions for the local treatment of the disease. G. S. D.

Sclerocorneal Trephining as Taught by Elliot.

JACKSON, EDWARD, Denver (*Ophthalmic Record*, April, 1914), gives a general description of the various steps of Elliot's operation, and gives the reasons for each step taken. G. S. D.

The Oculist as Interior Decorator.

WIPPER, OTTO, Chicago (*Ophthalmic Record*, April, 1914). Wipper's thesis is that the oculist should be an advisor in interior decorations. G. S. D.

Glaucoma as a Contributing Etiologic Factor in Insanity. With Report of a Case.

WELTON, CARROLL B., Peoria (*Ophthalmic Record*, May, 1914). Patient, sixty-nine years old, developed an attack of ocular inflammation in September, 1911. Pain was extremely severe, and drugs had to be given continually for several months. In September, 1912, she became totally blind.

From the large amount of morphin taken and from constant worry about her condition, insanity developed, and she was adjudged insane and committed to a state hospital.

The eyes then presented the typical picture of an absolute glaucoma. Trephining was performed on each eye, and her pain and discomfort relieved. Vision, however, could not be restored, and the mental condition of the patient remained the same. G. S. D.

Retinochoroiditis Juxtapapillaris.

APPLEMAN, LEIGHTON F., Philadelphia (*Ophthalmic Record*, May, 1914). This disease is a localized inflammation involving the retina and choroid immediately beyond the disc. It occurs in young, healthy adults, and the cause is not known.

Appleman reports a case. A scotoma beginning at the blind spot and extending out into the nasal field was present. The disc was swollen, and the edges obscured. Swelling extended into the retina above and to the temporal side. Vision was reduced to 5/21.

Under atropin, sweating, inunctions and iodids, the inflammatory condition improved, the vitreous opacities disappeared, and the vision returned to normal, but a considerable area of degeneration near the disc remained.

Jensen, who described the disease, believed the loss in the peripheral field to be due to thrombosis of the arteries as a result of the exudate around the disc.

Gross-Peterson attributes the defect to the destruction of the optic nerve fibers.

Up to the present, however, no satisfactory cause for the disease has been found. G. S. D.

Diagnosis of Heterophoria From a Portrait.

MITCHELL, S., Hornell (*Ophthalmic Record*, May, 1914), calls attention to the fact that portraits of Abraham Lincoln show a well marked left hyperphoria. G. S. D.

Optic Pseudoneuritis.

CALHOUN, F. PHINIZY, Atlanta (*Ophthalmic Record*, May, 1914). Optic pseudoneuritis is a condition not uncommon in the practice of ophthalmology. It is most often seen in high degrees of hypermetropia. Calhoun calls attention to the necessity of careful examination and observation, in order that a wrong interpretation of the appearance may not be given.

He advances the suggestion that the appearance may be accounted for by the presence of medullary nerve fibers slightly pigmented. G. S. D.

Light and Eyestrain.

GOETZ, H. E., Knoxville (*Ophthalmic Record*, May, 1914), discourses on the properties of light and eyestrain. He believes that mercury vapor light is not good for the eyes, and that investigation would develop the fact that it is actually harmful. (Research does not bear out this contention.—Reviewer.) The writer emphasizes the importance of eyestrain due to improper artificial illumination. G. S. D.

Castor Oil as a Menstruum for Cocain.

MITCHELL, S. JR., Hornell (*Ophthalmic Record*, May, 1914). The writer believes that this combination may be used, with excellent effect, in painful diseases of the cornea.

G. S. D.

Soap and Water and Opticians.

MAY, CHARLES H., New York (*Ophthalmic Record*, May, 1914), notes that none of the principal optical establishments in New York City have facilities for washing the hands in the store proper, and he suggests that wash basins should be installed in plain sight of the public.

G. S. D.

Albinism of the Eyes Without Involvement of the Hair or Skin

GAMBLE, WILLIAM E., Chicago (*Ophthalmic Record*, May, 1914). Patient was twenty-seven months old, and showed lateral nystagmus and albinotic eyes. No evidence of albinism in other parts of the body was found. Gamble calls attention to the rarity of albinism of the eye alone.

G. S. D.

A Keratome Which Facilitates the Elliot Trephining Operation.

JOBSON, G. B., Franklin (*Ophthalmic Record*, May, 1914). Illustration shows a small, angular knife, with a rather narrow blade. No written description is given.

G. S. D.

A New Method of Preparing an Eye for Microscopic Sections.

WRIGHT, HAL R., Columbus (*Ophthalmic Record*, May, 1914). The eye is suspended in a reservoir containing fixation fluid. A pipette is inserted in an opening made in the

vitreous with a Graefe knife. This pipette is connected with a bottle suspended above, which contains the same fixation fluid as the lower reservoir. By its use, it is claimed that intraocular pressure is maintained and the tissues fixed in their normal positions.

G. S. D.

Experiments on the Cultivation of So-called Trachoma Bodies.

NOGUCHI, H., AND COHEN, MARTIN, New York (*Archives of Ophthalmology*, March, 1914). The writers have come to the view that trachoma bodies are definite pathologic organisms, and that their occasional occurrence in gonorrheal conjunctivitis is a coincidence not to be explained by the transformation of gonococci into trachoma bodies.

They have succeeded in cultivating the organism outside the body. Their material consisted of conjunctivitis with trachoma body inclusions, typical trachoma without trachoma bodies, and acute catarrhal conjunctivitis with neither trachoma nor cell inclusion affections. Scrapings from the conjunctiva were placed in a tube of ascitic fluid, following the procedure used for cultivating spirochetæ. A piece of rabbit kidney was added to the ascitic fluid. A layer of paraffin oil was also added, and the tube kept in an anaerobic jar at 37° C. for about ten days. When stained by Giemsa, many minute coccoids were isolated.

The best medium was found to be two parts of slightly alkaline beef infusion agar and one part of ascitic fluid, with .05 per cent of glucose. Pure growths were obtained.

The organisms are illustrated in sixteen illustrations which accompany the article.

The organism was isolated from conjunctivitis with inclusions from trachoma bodies and trachoma cases without inclusions. It was not found in other forms of conjunctivitis without inclusions.

Inoculations of monkeys were negative. In other suitable animals the inclusions could be produced by direct inoculation of human trachoma without cell inclusions. Trachoma bodies in gonococcus infection are entirely distinct. Whether the former trachoma organism and the organism isolated in the study are identical is now under investigation.

G. S. D.

Some Results After Trephining.

KNAPP, ARNOLD, New York City (*Archives of Ophthalmology*, March, 1914), prefers a 2 mm. trephine and a large buttonhole iridectomy. A small buttonhole is not satisfactory.

One case is reported, where, although the cystoid cicatrix was not formed, the tension remained at 18.

Detachment of the choroid occurred in three cases: recovery in one case after two weeks, in the other two from six to eight weeks.

Prolonged hypotension resulted in the formation of a great many iritic adhesions. Three cases have a tension of 10, 5 and 6. Knapp regards the extreme softness of two of the eyes as alarming.

There were two late infections. The tendency to iritis after this operation is pronounced.

Knapp uses atropin ointment in the conjunctival sac at the close of the operation.

A large cystoid cicatrix should cause some anxiety.

He calls attention to the peculiar form of cataract seemingly due to a wrinkling of the posterior capsule of the lens following the LaGrange operation.

In consideration of the danger of complications, there is no reason to abandon iridectomy in cases of acute glaucoma or of early glaucoma where there have only been prodromal attacks.

Knapp believes in early operation on an eye with increased tension before the process has become chronic. He believes that even an apparently healthy eye should be operated upon when glaucoma has developed in the other. G. S. D.

Angioma of the Lids and Brow.

LEMERE, H. B., Omaha (*Archives of Ophthalmology*, March, 1914). Patient, five months of age, showed at birth a small purplish tumor, the size of the nail of the little finger, on the left lower lid. This rapidly increased, covered the whole upper lid, and extended up into the brow.

Treatment consisted of injections of boiling water, and in the morning and afternoon with alcohol. Injections were made superficially, and covered a period of one week. Injections were then made daily for three weeks. The hot water

was omitted, and twenty to forty minims of alcohol used. Injections were made less frequently, and the result was exceptionally good, as reported by the author and shown by photograph.

G. S. D.

New Combination Trial Lenses for the Refraction of Cataract Cases.

DENNIS, DAVID M., Erie (*Archives of Ophthalmology*, March, 1914). The feasibility of grinding sphericals and cylinders in one lens is suggested, to be used in refracting cataract cases.

G. S. D.

A Contribution to the Study of Endogenous Gonorrheal Corneal Affections.

PINCUS, FRIEDRICH, Cologne (*Archives of Ophthalmology*, March, 1914). The occurrence of metastatic or endogenous gonorrheal conjunctivitis is universally recognized. Heerfordt found twenty-three cases of metastatic conjunctivitis among 2300 cases of gonorrheal urethritis. They occurred principally in the bulbar conjunctiva, and developed under the conjunctival surfaces, often with the formation of a phlyctenule. This description coincides with the one given by Elschnig.

Groenouw and Saemisch mentioned the prevalence of the involvement of the fornix.

Pincus reports a case suffering from urethritis, that developed a conjunctivitis, and showed a markedly edematous lower fornix, which protruded like a cyst. The adjoining ocular conjunctiva was normal. Conjunctival smear negative; urethral and vaginal smear positive.

There are great difficulties in proving the occurrence of endogenous gonorrheal keratitis. It is necessary that gonococci should be demonstrated in the discharge from the urethra or the genitals at the time of the onset of keratitis.

Second, the keratitis must not be the only manifestation of a systemic gonorrheal infection.

Third, if a conjunctivitis is present, the smear must be negative for gonococci to exclude the possibility of an external infection.

Finally, we must endeavor to avoid the pitfalls of a complicating keratitis.

Pincus reports a case of a thirty-one-year-old man, who showed a urethritis and arthritis. The cornea showed small,

superficial, rounded opacities; in the center a larger, irregularly shaped epithelial defect with an opaque base. Later small hypopyon developed. Similar condition developed in the other eye.

The second case was fifty-four years old, and had a urethritis and arthritis. The eye showed a marked conjunctivitis, and later epithelial defect.

Pincus reviews the various appearances of metastatic gonorrheal keratitis, and combats Heerfordt's view that keratitis is always secondary to a gonorrheal subconjunctivitis. The majority of cases are characterized by disease of the corneal epithelium, which may be compared with herpetic corneal disease. Healing takes place very quickly. G. S. D.

A Fifth Case of Acute Disseminated Myelitis With Retrobulbar Inflammation of the Optic Nerves.

HOLDEN, WARD A., New York (*Archives of Ophthalmology*, May, 1914). The writer has previously reported four somewhat similar cases.

The patient, a man forty-three years old, noticed a numbness in the soles of his feet in March, 1912. Numbness gradually affected entire body below the clavicles, and in April the body was completely paralyzed and anesthetic. Three weeks later there was improvement. Six weeks later he was able to walk.

Three months after onset, diminution of vision in right eye, with pain in right eye and temple, also fever. Ten days later the eye was blind, and vision of left eye began to fail.

Vision: Right, no perception of light; left, fingers at three feet.

Left field showed a temporal hemianopsia. Both discs showed pallor of their inferotemporal sectors.

Arms weak, tremor of both hands, gait unsteady. Knee, ankle and arm jerks increased. Pupils were equal.

Improvement took place, and in March, 1913, vision reached 20/70 in the right eye and 20/30 + in the left. The fields showed a slight concentric contraction for white and red. Temporal pallor of discs well marked.

Holden calls attention to the fact that in over half the cases of visual complications of disseminated spinal myelitis there is a lateral hemianopsia for one eye alone. G. S. D.

A Case of Permanent Impairment of Vision Following Gastro-Intestinal Hemorrhage.

GROUT, G. H., New York (*Archives of Ophthalmology*, May, 1914). Loss of vision following excessive loss of blood is exceptionally seen. Some underlying factor, in addition to the loss of blood, is necessary. Various defects of the visual field have been found. In 20 per cent of cases there was concentric contraction, in 10 per cent an homonymous hemianopsia, lower half of field lost in 23 per cent, and a central scotoma in 13 per cent.

The defect in Grout's case can be explained by blocking of the retinal arteries.

A carpenter, sixty-six years of age, gave a history of severe abdominal pain and vomiting with blood. Blood was passed in the stools until he became exsanguinated. After a few days he noticed that part of the field of vision was gone.

Vision, right eye, equaled 3/200; left eye, equaled 15/200. Of the right visual field only the superior temporal sector remained. In the left, the upper half of the field was lacking.

Examination showed diffuse pallor of the discs and blocking of several small retinal arteries near the margin of the disc.

G. S. D.

Report of the Successful Treatment of a Corneal Tumor With Radium, With Remarks on Radium in Ophthalmology.

MATTICE, ALBERT F., New York (*Archives of Ophthalmology*, May, 1914). The only systematic study of the use of radium in diseases of the eye has been made by Prof. W. Koster, of Leiden. He began his work in 1905. At first, Koster used an ebonite container with 5 mg. of radium bromid, acting through a thin layer of mica. Glass tubes were also used. During the last two years Koster has used mesothorium, which is more powerful than radium, and he now makes use of small glass tubes of a special shape.

Koster reports favorable results in keratitis parenchymatosa, in phlyctenular keratitis, syphilitic keratitis, corneal scars, scleritis, iritis, iridocyclitis, choroiditis, vitreous opacities, intraocular and retinal hemorrhage, also in tumors of the lids, orbit and eyeball.

Koster thinks that radium rays not only have the power to destroy tumor cells, but when properly applied render normal tissues less sensitive to infection and tumor growth.

Mattice reports a case, seen by him in Vienna, of epithelium of the cornea. There were two flesh colored growths, which were situated partly on the cornea and partly on the bulbar conjunctiva. The intervening corneal tissue was covered with a pannus-like growth. Diagnosis of epithelioma was made clinically.

Radium, in the form of the barium carbonate salt, was used, with six minute applications. Three applications were made during six weeks, and the tumor fairly seemed to melt away.

Vision at the time of beginning treatment was light perception. Three months after he was discharged, no trace of the tumor was to be seen, and the vision was 20/70.

The time of application of radium was six, twelve and fifteen minutes. Koster gives thirty and sixty minute treatments. Considerable reaction follows the application.

G. S. D.

Anatomic Study of a Case of Temporal Conus (Coloboma) in an Hyperopic.

BROWN, E. V. L., Chicago (*Archives of Ophthalmology*, May, 1914), found a crescentic defect in the pigment epithelium, choroid, and the inner layers of sclera along the temporal border of the disc. The defect was almost entirely covered over and filled by a fold of the retina, a direct continuation of the two nuclear layers. The nerve fibers did not dip into the conus at all. The anterior layers of the sclera were absent on the floor of the conus, but there was no ectasia of the sclera. The eye was of a hypermetropic type.

The writer gives a thorough and careful consideration of the subject, with the views of other observers.

The best explanation given was represented by Elschmig's theory of excessive proliferation of the margins of the secondary optic vesicle and subsequent interference with the development of the choroid and sclera. The reason for the excessive proliferation is not given.

G. S. D.

Some Technical Points Which Increase Efficiency of the Operation for Excision of the Lacrimal Sac.

POOLEY, S. H. (*Ophth. Rec.*, November, 1913). It was sometimes a very long time before the acute cases would settle down completely.

Patients were often troubled with epiphora, and there was

often a little regurgitation of clear fluid on pressure over the area of the sac. This was particularly apt to be the case in those patients who had had the canaliculus slit, or who had worn styles, the remains of which were not infrequently found embedded in large masses of granulation tissue to one side of the sac, the lumen of which had become occluded. I came to the conclusion that the presence of the canaliculi, with probably retention of a little bit of sac in connection with them, was responsible for the maintenance of the condition. I have, therefore, modified my technic as follows:

With the patient under a general anesthetic (1) I thoroughly dilate both puncta and pass a probe along the canaliculus into the sac. I then wash out the contents of the lacrimal sac with a syringe and inject a 1 per cent watery solution of methylene blue into it. (2) I make a curved incision from above downwards, with its center about one-third of an inch on the nasal side of the inner canthus. I carry this down to the *tendo oculi*, which I divide; I then separate the sac from the *periosteum* below with a blunt dissector or with scissors if there are adhesions, and after isolating it as far as possible on the nasal side, I divide it below, turn it up and remove it in the ordinary way, dividing the canaliculi. I then scrape the bony part of the lacrimal canal with a small sharp spoon. I remove the Müller's retractor, which is still holding the wound open, the pattern I use having very short blunt hooks, and pick up the end of the probe which is in the wound with forceps; with a few snips of the scissors, carefully keeping the points very close to the probe, I am able to free the attachments of the canaliculus on its deeper surface.

I carefully separate the canaliculus from the conjunctival surface and then, holding the end of it with a pair of fixation forceps, free it all round, seize the end and divide it either close to the punctum or in its outer third, after removing the probe. I then treat the upper canaliculus in the same manner. When this is done I put a catgut or silkworm gut suture in so as to unite the deeper part of the wound, including the *orbicularis* muscle and the *tendo oculi*, to the *periosteum* on the nasal surface. I use a continuous suture, as is usually employed for subcuticular suturing, and bring the two ends of it through the skin at the upper and lower extremities of the incision respectively. If necessary a deep catgut

and a superficial silkworm suture can be used; the ends of the sutures may be either fastened to the skin by plaster or tied to the ends of an interrupted suture, which in that case is placed at each end of the wound. The catgut sutures are left to absorb, the silkworm ones can be easily removed by pulling on one end.

In those acute cases which do not quiet down after repeated hot fomentations and small incisions, I usually perform practically the same operation as the above, but I remove as much of the granulation tissue as I can with the sac, removing the outer part of the canaliculus and packing the wound with ribbon gauze. This complete extirpation of the inflamed area I have found most successful, and patients are usually able to go home in a fortnight with the wound completely closed and everything quite quiet.

DIFFICULTIES AND DANGERS.

(1) Unsightly scars. (a) This is best avoided by keeping the incision as near the inner canthus as possible. (b) By suturing the tendo oculi to the nasal periosteum or by uniting the two ends of it.

(2) Hemorrhage during operation. This is usually no bar to the success of the operation. It is usually most troublesome in cases which have been recently acute, and can usually be controlled by sponging with adrenalin. It is a mistake to waste time in arresting hemorrhage, it generally stops when the operation is complete.

(3) In excising the canaliculus be careful not to wound either conjunctiva or skin, although no particularly unpleasant occurrence follows a buttonhole or two.

(4) Sepsis. This does not often happen, but I now paint the skin before I make my incision with a solution of iodine in spirit, while the surrounding skin should be shut off by gauze whilst suturing.

N. M. B.

A Case of Inflammatory Edema of the Optic Nerve Due to Acute Suppuration of Antrum of Highmore.

FOSTER, J. (*Ophth. Rec.*, November, 1913). Whilst there are abundant and convincing records in the literature devoted to this subject, to show that accessory sinuses are responsible for pathologic conditions of the optic nerve, and, to be more

explicit, especially is this so in sphenoidal and postethmoidal cell disease, and perhaps in a lesser degree in anterior ethmoidal cell and frontal sinus disease, the records where the antrum of Highmore has been held to be responsible for affections of the nerve are very sparse indeed. It is, however, quite true that one can find numerous instances of multiple sinus trouble (in which the antrum was involved) in direct causal relationship to disease of the optic nerve.

Three cases reported in literature are mentioned, then follows the report of the writer's case. N. M. B.

The Luetin Test for Syphilis and Some Results.

BROWNING, S. H. (*Ophth. Rec.*, January, 1914). The different lines of investigations along which research may be made in order to determine whether a disease is caused by a certain organism are referred to, as is also the difficulty in obtaining a specific antigen, which was overcome by Noguchi, who gives to this emulsion of spirochete the name "luetin." The preparation, method of application and reaction are outlined.

Nearly all the cases have been controlled by the Wassermann reaction, or perhaps it would be more correct to say that the Wassermann reaction was done at the same time, for in some cases the luetin test has acted as a control on the Wassermann reaction. In several cases the Wassermann test has been negative, while the luetin test has been positive, and in most of these cases there has been little doubt that the patients have been syphilitic from a clinical point of view, e. g., interstitial keratitis with other congenital syphilitic stigmata. In a few cases I have obtained a positive Wassermann and negative luetin test.

The fact that the luetin test is positive in some cases is not greatly to be wondered at when one comes to consider the extraordinarily delicate nature of the anaphylactic phenomena compared with the comparatively gross nature of the complement fixation test. The superiority of the luetin test over the Wassermann reaction is especially marked in the chronic course of the disease when the Wassermann reaction is only positive in 67 to 70 per cent of the cases.

Perhaps one of the most important features of the luetin test is that it brings within the reach of all practitioners a

simple and reliable test for syphilis, the result of which they can see and judge for themselves. This of itself is a great boon, as many practitioners have patients who cannot afford the fee necessary to have the test done by a reliable authority, and they would rather rely on their clinical experience than have the test done and not be able to trust the result.

N. M. B.

Note on Elliot's Operation.

GRIFFITH, A. H. (*Ophth. Rec.*, January, 1914). Having sometimes failed to make the opening into the anterior chamber sufficiently near the corneal margin, my first modification was to separate the conjunctiva from the margin of the cornea and then place the trephine exactly where I wanted it, usually just overlapping the clear cornea; in this way I always succeeded in getting a complete prolapse of iris and a pupil reaching the sphincter; then I closed this opening by one very fine black suture going through the conjunctiva above and the edge of the corneal aperture furthest from the conjunctival flap. The results were quite good, and if one uses a very fine curved and sharp needle there is no difficulty in passing the needle, as I think is safest, through the superficial layers only of the cornea.

I now simply place the trephine right on the eyeball, without any interference with the conjunctiva, so that a portion, perhaps one-third or less, of the cutting circle is in the clear cornea. The instrument is rotated in the usual way until the pupil is seen to become slightly pear-shaped, when it is withdrawn, and in every case we get a large prolapse of iris with the little circle of sclerotic and cornea lying on the top of the prolapse. A few crystals of cocain are put on the prolapsed iris, and this is gently drawn out and snipped off. The opening is closed by one fine suture through the conjunctiva in a horizontal direction.

N. M. B.

ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

BY

ALBERT C. SAUTTER, M. D.,

PHILADELPHIA.

MAX W. JACOBS, M. D.,

ST. LOUIS.

J. W. CHARLES, M. D.,

ST. LOUIS.

The Pathology of Ulcus Rodens Corneae.

ICHIKAWA (*Klin. Monatsbl. f. Augenheilk.*, July, 1913) found in his case large numbers of eosinophiles in the granulation tissue of the ulcer, especially in the younger portions. The patient was only forty years old. Ichikawa comes to the conclusion that ulcus rodens is due to a specific infection which begins in the episclera. There a localized granulation tissue develops which on the one hand advances over the cornea under the superficial epithelium like a pannus, and on the other hand spreads subconjunctivally around the limbus. In the cornea the adjacent tissue (the lamellae and epithelium), as a result of impaired nutrition, or perhaps owing to the presence of a toxin arising from the granulation tissue, degenerates, leading to ulcer formation at the corneal periphery. Treatment should be directed toward destruction of the foci in the conjunctiva and episclera, and not alone against the corneal lesions. M. W. J.

Five Cases of Congenital Hydrophthalmos, With Special Reference to the Pathologic Anatomic Findings.

TAKASHIMA (*Klin. Monatsbl. f. Augenheilk.*, July, 1913) examined five eyeballs of patients between the ages of nine and fourteen years. In all cases enlargement of the eyeball

was noticed shortly after birth. All had a deep anterior chamber and broad corneal base.

Takashima reports numerous measurements. The paper will be finished in a later number of the journal. M. W. J.

Concerning the Relationship of Lymphocytosis to Ocular Injuries and Sympathetic Ophthalmia.

FRANKE (*Gräfe's Archiv. f. Ophthal.*, Vol. 85, Part 2; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, February 12, 1914), from a study of fifty-five cases, concludes that lymphocytosis in sympathetic ophthalmia has no diagnostic or prognostic significance. Rather striking is the frequent occurrence of lymphocytosis after severe injuries of the eye with normal restitution; also after injuries which as a rule are not apt to be followed by sympathetic disease.

On the other hand, the absence of lymphocytosis in cases of injured eyes which have become quiet should not exclude the possibility of inflammatory recurrence. A. C. S.

Eye Diseases in Java.

WESTHOFF (*Centralbl. f. prakt. Augenheilk.*, February, 1913) states that the Javanese are usually emmetropic and that myopia and astigmatism are rare. Presbyopia occurs about five years earlier than in Europeans, and color blindness is frequent. Blepharitis is rare. He has noted that at the outer canthus the lid and globe do not approximate. This provides a place for the accumulation of dust with consequent follicle formation. Phlyctens are rare. Koch-Weeks epidemics occur occasionally, and Morax-Axenfeld infections are common. Xerosis of the cornea and conjunctiva are also frequently seen. Pterygium is common. He thinks his patients prove that exposure to dust and wind is not the cause, since his patients include young and old in all walks of life.

Keratitis punctata tropica, which he described in the October number of the same journal, is one of the typical tropical diseases met with. Ulcus serpens is rare, as disease of the tear sac is not often encountered. Retinitis pigmentosa is called chicken blindness. Rubbing the eye with the penis of the husband or with the big toe are some native remedies.

M. W. J.

Contribution to the Pathologic Anatomy of Embolic Metastases of the Eye.

HEGNER (*Klin. Monatsbl. f. Augenheilk.*, June, 1913) describes a case in which an embolus of the central artery of the retina produced an aneurismal pouching of the central vessel of the eye. Numerous other emboli were found in the same eye. The patient, who suddenly became blind, had been suffering with a chronic recurrent fibrous verrucose endocarditis of the mitral and aortic valves. Macroscopically there was found a dark pin-head size area 3 mm. posterior to the lamina cribrosa. The mass appeared homogeneous, faintly colored and surrounded by round and polynuclear cells. From postmortem examinations we know that mycotic emboli are most often the means of producing metastatic infection. Although difficult to prove experimentally, toxins in such foci produce secondary inflammation. Clinically and histologically at least, this seems to be the case.

Aneurisms of the central artery of the retina hitherto described were not of inflammatory origin, as in Hegner's patient.

M. W. J.

White Cilia.

OESTERREICHER (*Prager med. Woch.*, 1913, No. 35; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, February 5, 1914). Canities or poliosis of the cilia is usually observed in albinism. Acquired canities is generally due to vitiligo, and may be the only manifestation of the process. White cilia have also been observed in fifth nerve neuralgias, hemicrania, hysteria, neurotic poliosis, sympathetic ophthalmia, iridocyclitis and keratitis parenchymatosa. Elschnig's conception of sympathetic ophthalmia as an anaphylactic manifestation resulting from sensitizing of the pigment containing uvea, suggests similar involvement of the cilia. Canities of the cilia has also occurred after exposure to cold and in trachoma, where it is probably the result of trophic disturbances.

In cases in which canities follows rapidly, entrance of air into the cilium seems likely. Spiegler's and Raehlmann's investigations point to the possibility of a white pigment formation the result of trophic influences.

Occasionally after epilation stimulating ointments have caused pigmented lashes to appear. In stationary cases the lashes may be dyed or the ciliary base tattooed with Chinese ink.

A. C. S.

The Development of Amyloid Degeneration of the Conjunctiva.

ISHIHARA (*Klin. Monatsbl. f. Augenheilk.*, July, 1913) reports in detail two cases of amyloid degeneration of the conjunctiva, one bulbar, the other tarsal in origin. In the first named the amyloid substance developed from the plasma cells, in the second from connective tissue fibers. He concludes from his observations and a study of the literature that there are at least two ways in which amyloid degeneration originates. The form which develops from plasma cells seems characteristic of local tumors, while that which arises from tissue reticulum seems able to produce both local and general amyloidosis.

M. W. J.

Conjunctivitis Due to Eel Blood.

TAKASHIMA (*Klin. Monatsbl. f. Augenheilk.*, June, 1913) agrees with Rahlston, who showed that the ichthyotoxin found in the serum of eel blood is the chief active element. Takashima found that eel blood, when simply instilled into the conjunctiva of animals, produces a mild lesion of the conjunctival epithelium and of the subconjunctival tissue. When the epithelium had been previously injured, the reaction was much more severe, showing that the amount of reaction depends on the degree of absorption.

M. W. J.

Two Cases of Actinomycosis of the Eye.

ROSENHAUCH (*Klin. Monatsbl. f. Augenheilk.*, June, 1913) saw a woman of twenty-eight years, who for nearly three months complained of the sensation of a foreign body under the right lid. The symptoms were thought to be the result of having gotten some carraway seed into the eye. Examination showed a small cluster of yellow points on the upper tarsal conjunctiva. Scrapings from this area revealed actinomycosis albus.

The second patient, a girl of eleven, who at the time was suffering with coryza, was struck on the right eye with a bough. Ulcer of the cornea followed, and scrapings showed actinomycosis albus.

M. W. J.

Papilloma of the Cornea.

PICCALUGA (*Klin. Monatsbl. f. Augenheilk.*, July, 1913). A peasant woman, sixty-eight years old, presented herself on

November 18, 1905, with a small growth in the inner angle of the eyeball. Growth was removed. January 3, 1911, the patient reported that in August, 1910, she noticed a small elevation at the inner side of the left limbus of the cornea. Two years prior she had observed a lump on the right cheek, and for the previous five months this mass had ulcerated. Nine months before, a wine colored patch had appeared on the left cheek. An enucleation was performed. On June 6, 1911, patient returned with a widespread epithelioma of the orbit, and exenteration was performed. The patient died in January, 1912, as a result of cranial involvement.

Histologic examination of the limbic growth showed it to be a typical papilloma. Piccaluga believes that it was a pure coincidence that both varieties of tumor were present, and could find no relationship between the two types of tumor.

M. W. J.

Dermoid of the Eye.

KRAILSHEIMER (*Klin. Monatsbl. f. Augenheilk.*, June, 1913) describes in detail a teratoid growth of the eyeball taken from the limbus region. He quotes Gallenga, who explained the appearance of such growths on the theory that during development an invagination of the fornix region occurs, and that instead of the usual development of tear gland and Krause's glands, a disturbance of development occurs, resulting in an ectopia of the subconjunctival structures.

M. W. J.

Clinical Contribution to Circinate Degeneration of the Retina. With Especial Consideration of Atypical Varieties.

HEINRICH AND HARMS, Tuebingen (*Graefe's Archiv. f. Ophthalm.*, Vol. 86, Part 3, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, April 2, 1914), studied eighty cases of typical and atypical retinitis circinata occurring in Prof. Schleich's clinic.

The atypical varieties showed ring formations beyond the macula. Seventy-five per cent of the cases were associated with vascular disease. Localized disease of the smaller vessels and capillaries surrounding the macula probably is responsible for the typical ring formation. In ten cases there were diseases favoring vascular degeneration, namely, diabetes, gout, albuminuria and leukemia. In four cases no constitutional disease was associated.

A. C. S.

The Etiology of Luetic Parenchymatous Keratitis.

IGERSHEIMER (*Gracfe's Archiv. f. Ophthalm.*, Vol. 85, Part 2; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, February 12, 1914) still holds to the view ascribing the corneal changes to the presence of spirochetæ in the cornea. In the fetus, newborn, and in animals, the keratitis is directly due to the action of the spirochetæ, whereas in older individuals, in addition, there must be taken into account a specific altered reaction capacity of the corneal tissue. Spirochete products from luetic lesions in other parts of the body may contribute to the development of the affection. A. C. S.

Concerning v. Hippel's Disease of the Retina.

MELLER (*Arch. f. Ophthalm.*, Vol. 85, Part 2, July, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, February 5, 1914). This disease is a rare affection, characterized by marked dilatation of a pair of vessels, grayish discoloration and thickening of the periphery of the retina with large round red spots into which the retinal vessels penetrate.

From examination of a typical case Meller views the process as a diffuse telangiectatic gliosis of the retina, in other words, a new tissue formation, a glia-like tissue leading also to new formation of vessels. The disease is not to be considered a secondary gliosis nor a capillary angiomatosis. Goldzieher arrived at the same conclusions. A. C. S.

Concerning the Formation of Folds in the Retina During the Period of Development.

FARNARIER (*Klin. Monatsbl. f. Augenheilk.*, June, 1913) protests against the assertions of Lindenfeld in a recent article in this journal, in which she states that Farnarier's so-called rosette-like bodies were artifacts. He calls attention to the fact that the constituent parts of the cells are intact, and that folds are also present as in her case. M. W. J.

Regarding Angioid Pigmented Striae Formation of the Retina.

BAYER (*Klin. Monatsbl. f. Augenheilk.*, June, 1913) reports two cases of angioid pigmented streak formation. He considers the process a distinct morphologic affection of the retina, and not a process accompanying some other known

condition. He discusses the theory of Lister, which holds that the picture is one of new vessel formation, and the idea of Magitot, that we are dealing with old hemorrhages. Bayer believes that numerous additional pathologic examinations must be made before any definite decision is possible.

M. W. J.

Ophthalmoscopic Findings in the Area Centralis of the Albinotic Eye.

ICHIKAWA (*Klin. Monatsbl. f. Augenheilk.*, July, 1913) examined six totally albinotic individuals. He could find no differentiation of the retina at the fovea. He considers his findings in line with those of Fritsch and Elschnig, who found anatomically a lack of development of the macula.

M. W. J.

Traumatic Angiopathy of the Retina.

PURTSCHER (*Centralbl. f. prakt. Augenheilk.*, January, 1913) describes several cases in which after head injuries white areas appeared of from one-fifth to entire disc diameter in size, in the region of the optic nerve and macula, especially along the retinal veins. Liebrecht, who reported similar cases, considered the lesions due to a fatty change in the glial fibers. Purtscher's cases showed no albumin or sugar in the urine. Similar lesions have been seen after rupture of the liver by compression. Purtscher suggests that the lesions are not lymph extravasations, but changes due to lymph extravasations.

M. W. J.

Ophthalmoscopic Findings in Pulsating Exophthalmos.

RUEBEL (*Klin. Monatsbl. f. Augenheilk.*, July, 1913) found pale yellow areas of irregular form in the fundus of a pulsating exophthalmic eye. The spots disappeared in a short time after the common carotid had been ligated, and marked improvement in the exophthalmos ensued. Ruebel believes the areas were edematous.

M. W. J.

Gummatous Papillitis After Salvarsan Injection.

KUMOGI, Tokio (*Archiv. f. Augenheilk.*, Vol. 75, Part 1, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, February 26, 1914), reports a case occurring one and one-half months after subcutaneous treatment with salvarsan. In spite of sal-

varsan therapy there ensued specific angina and swelling of the lymph glands. There was an eight diopter swelling of the nerve associated with marked swelling of the adjacent retina and striated hemorrhages. The condition readily yielded to mercury and iodids. A. C. S.

A Case of Optic Atrophy Following the Use of Atoxyl in Syphilis.

KALASCHINKOW (*Centralbl. f. prakt. Augenheilk.*, March and April, 1913) arrives at the following conclusions after a study of one case and a careful review of the literature:

1. In pronounced atoxyl poisoning the peripheral ends of the optic nerve and then the entire nerve become involved. With this involvement is closely associated contraction of the retinal arteries. After the visual field has contracted, the nervehead then gradually whitens, particularly on the inner side. This is followed by further contraction of the arteries, and sometimes by complete loss of color perception.

2. Atoxyl, even in moderate doses taken over an extended period, is a very poisonous substance to the visual apparatus.

3. Because of the poisonous properties of atoxyl great care should be taken in its administration (fresh solutions, preferably with the French apparatus, warming and not boiling, small doses and large intervals between injections). A sine qua non is strict observation of the patient's eyes during treatment. At the first sign of failure of vision, treatment should be discontinued. M. W. J.

Fungoid Masses in the Tear Ducts.

LANGE (*Klin. Monatsbl. f. Augenheilk.*, June, 1913) publishes a cut in this article to demonstrate that he really did find the actinomyces in the patient described by him in 1897 and quoted by Wissmann in a recent article on fungoid masses in the tear passages, in the *Klin. Monatsbl. f. Augenheilk.* Lange admits the rarity of the condition, but wishes to remove any doubt concerning the authenticity of his case. M. W. J.

Fungoid Concretions in the Tear Ducts.

LOEWENSTEIN (*Klin. Monatsbl. f. Augenheilk.*, July, 1913) calls attention to the fact that botanists use the terms streptothrix and actinomyces synonymously, whereas Wissmann, who recently published a paper on this subject in this journal, has endeavored to make a distinction. At Elschmig's clinic

actinomycosis of the tear duct is treated by means of pressure on the sac and irrigations with oxycyanid solution. Loewenstein protests against slitting of the canaliculi excepting where the above measures have failed. M. W. J.

Disease of the Lacrimal Drainage Channels in Hereditary Lues.

IGERSHEIMER (Abst. in *Woch. f. Ther. u. Hyg. des Auges*, February 5, 1914) found in sixteen children with lacrimal disease only seven without luetic symptoms. In two cases of the hereditary syphilitics there was stenosis of the nasal passage without rhinologic findings; in eight, unilateral or bilateral purulent dacryocystitis; in three, lacrimal fistula; in one, dacryocystitis, and in two, phlegmonous dacryocystitis. Rhinologic complications occurred in nine, five being of a specific nature.

It appears that these affections originate either from the nose or the bony wall of the sac. Examination of the sac in three cases showed round celled infiltration, but no typical syphilitic infiltration and no spirochetes. Specific treatment of simple blennorrhea of the sac proved ineffectual, but dacryocystitis and phlegmonous dacryocystitis responded more favorably.

It is important to remember that lacrimal sac affections in children are often attributable to syphilis, whereas in adults a syphilitic etiology is exceptional. A. C. S.

Disease of the Hypophysis and Adjacent Structures and the Understanding of Hemianopsia of Binasal Type.

LANGE (*Klin. Monatsbl. f. Augenheilk.*, July, 1913) reports two cases of probable hypophyseal tumor characterized by excessive cheerfulness of the patient and marked variation in the visual acuity at different times. In a patient showing a binasal hemianopsia, Lange attributes it probably to a small hemorrhage in the upper part of the chiasm where, according to the researches of Bernheimer, the uncrossed fibers of the optic nerves are located. M. W. J.

Juvenile Glaucoma.

LOEHLIN (*Graefe's Archiv. f. Ophthal.*, Vol. 85, Part 13, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, March 19, 1914) reports the results of his investigations in ninety-two

cases, including in this group all cases of glaucoma under the thirty-fifth year. Most cases occurred between the fifteenth and twentieth year. Sixty-two per cent of the cases of glaucoma simplex occurred in the male.

In marked contrast to adult glaucoma, fifty per cent of the juvenile cases showed myopia. Glaucoma with deep anterior chamber only occurs in the young. The writer attributes the axial myopia to increased tension, although v. Graefe considered the increased tension secondary to the myopic changes.

Heredity plays an important role in juvenile glaucoma. As etiologic factors inherited developmental disturbances must receive consideration. The prognosis is not always unfavorable.

A. C. S.

Brain Abscess of Orbital Origin and Its Treatment.

ELSCHNIG (*Prager med. Woch.*, 1914, No. 6; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, April 2, 1914) was able to find only ten cases of brain abscess consequent to orbital abscess in the literature.

The past four years the author has observed three additional cases, in two of which he resorted to operation. Recovery followed in one case, this being the first recorded case of a cure in this affection.

Elschnig's operation consists in an incision along the upper orbital margin, exposure of the roof of the orbit with separation of the periosteum without opening of the orbitotarsal fascia, resection of the orbital roof to the extent of 2 cm. by $1\frac{1}{2}$ cm., approximately 1 cm. behind the orbital margin, incision of the dura and the overlying brain tissue, opening up of the abscess followed by drainage through the roof of the orbit.

Rhinogenetic and orbitogenetic brain abscesses are usually located in the frontal lobe immediately above the anterior portions of the orbital roof. Early diagnosis is extremely important.

A. C. S.

Concerning Rhinogenetic Frontal Abscess.

PIFFL (*Prager med. Woch.*, 1914, No. 6; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, April 2, 1914) reports a case of frontal abscess originating in the ethmoid cells, the infection then involving the orbit on the same side and finally the anterior cerebrum. After rhinologic treatment a marked im-

provement set in with partial regression of the orbital symptoms. Five weeks later symptoms of meningitis occurred, and in two days the patient died. In these cases the rhinologist should cooperate with the ophthalmologist. A. C. S.

A Case of Double Orbital Phlegmon After Empyema of the Frontal Sinus and the Ethmoid Cells, With Special Reference to the Pathologic Anatomic Findings.

TAKASHIMA (*Klin. Monatsbl. f. Augenheilk.*, July, 1913). The patient had a hyperplastic inflammation of the frontal sinus and the ethmoid cells, without any pus being present. Symptoms persisting after operation on the sinus were attributed to the fact that the patient had an acute purulent infection, first of one and then of both orbits. Takashima believes that the infecting organism was carried by means of the venous current from the sinuses, as at the postmortem examination no direct connection between the two foci, such as might be caused by a break in the bony wall, could be found.

M. W. J.

A Case of Peculiar Shot Injury.

HESSE (*Klin. Monatsbl. f. Augenheilk.*, July, 1913) observed the condition in a hunter who shot himself in the left side of the neck. The shot entered between the upper and middle third of the posterior border of the sternocleidomastoid, injuring one of the large veins with the production of a large hematoma. The missile passed through the foramen lacerum after miraculously doing no injury to the numerous vessels and nerves of the neck. The internal carotid and trigeminus escaped injury. There was some injury done as a result of lacerating the dura, the second and third branches of the trigeminus and facialis being slightly affected as a result of hemorrhages at this point. A possible injury to the uncus before the missile reached its final destination at the outer and lower side of the optic nerve was suggested by the fact that there was some olfactory disturbance shortly after the accident. Examination showed symmetric absolute scotomata of sector form, extending from the central point toward the periphery for 30 degrees. Beyond this point to the limits of the charted field the sectors showed relative diminution of sight. The author believes that this case contributes evidence in favor of the theory that comparatively early after leaving

the chiasm the fibers so arrange themselves that corresponding portions of the retina of both eyes are supplied by fibers which are closely associated and which soon pass into the subcortical visual centers in common. As before stated, Hesse's patient was injured 10 to 15 mm. behind the posterior angle of the chiasm. He had exact congruent hemianopic scotomata, which shows that the lesion must have been in a region where the interlacing of the crossed and uncrossed fibers as representing bilateral structures must be a very close one.

M. W. J.

Double Perforation of the Eye as the Result of a Penetrating Injury.

DAVIDS (*Klin. Monatsbl. f. Augenheilk.*, July, 1913) reports a double perforation as a result of a fall against a wire file. Infection followed, but patient made a good recovery with a serviceable eye. The patient did not know that the eye had been injured until several hours afterward, when his attention was called to the eye by others.

M. W. J.

Kuhnt's Conjunctivoplasty in Three Grave Perforating Wounds of the Globe.

SCHNAUDIGEL (*Muench. med. Woch.*, 1913, No. 34; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, February 5, 1914). In the first case there was a perforating wound of the sclera and one-half of the cornea, with prolapse of the ciliary body. The prolapse was excised and a conjunctivoplasty performed. Uneventful convalescence with vision 5/50.

In the second case there had occurred a 3 mm. long wound of the sclera extending entirely through the cornea. Traumatic cataract. Two pedicled flaps were necessary. Operative result good.

In the third case a blow on the eye caused pieces of spectacle lens to penetrate the ciliary body. Three 4 mm. long fragments of glass were extracted one hour after the accident, and the wound closed over by Kuhnt's method. Three months later eye quiet, but still full of blood. Corrected vision, 2/35.

A. C. S.

Iron Splinter in the Lens.

ELSCHNIG (*Klin. Monatsbl. f. Augenheilk.*, June, 1913) advises that splinters of iron in the lens should be extracted immediately if the capsule wound is open. In those cases in

which the wound is already closed, Elschnig thinks the attempt at extraction should still be made, providing the lenticular opacity has not progressed too far. M. W. J.

A Case of Late Infection Following the Elliot Trephine Operation.

ISAKOWITZ (*Klin. Monatsbl. f. Augenheilk.*, June, 1913) reports an acute infection of the anterior chamber six weeks after the patient had been discharged following an Elliot operation. Marked improvement followed the use of atropin, collargol ointment, dionin and moist heat. Incidentally he advises using v. Hippel's automatic trephine from which the check ring has been removed. M. W. J.

Late Infection After Trephine Operations.

AXENFELD (*Klin. Monatsbl. f. Augenheilk.*, June, 1913) places the Lagrange and Elliot operations in the same class. His patient, three-fourths of a year after a Lagrange operation, developed a fistula in the cicatrix, with infection of the anterior chamber. He thinks that possibly such accidents can be avoided when the conjunctival flap is made as thick as possible. Axenfeld fears that the report of an occasional late infection after Elliot operations may weaken our faith in that procedure when the facts do not warrant any such lack of confidence. M. W. J.

Operative Treatment for Impaired Vision in Tower Skull.

SCHLOFFER (*Klin. Monatsbl. f. Augenheilk.*, July, 1913) believes that the relief of pressure by means of trephining and incision of the corpus callosum (Balkanstich) does not give as favorable results, so far as vision is concerned, in cases of tower skull as in the case of new growths of the brain. Behr of Kiel suggested that in this condition the optic nerve becomes incarcerated between the carotid and the upper wall of the optic canal just before the point of entry. In individuals so afflicted the upper wall of the bony optic canal overhangs the lower, and thus provides an unyielding surface against which the optic nerve could be injured if undue pressure were made by the internal carotid below it.

Schloffer therefore advises removal of the upper wall of the optic canal. He has performed the operation twice on the liv-

ing. After a bony flap has been made in the anterior wall of the frontal bone, the frontal lobe of the brain with the dura is raised and the cerebral opening of the optic canal carefully approached. After the optic nerve becomes visible in its intracranial portion, the roof of the canal is removed. There was apparently some improvement, but the principal value of Schloffer's report lies in the fact that while the operation has been proven possible, still its value can only be proven by a larger series of cases.

M. W. J.

Discussion of Van der Hoeve's Article on Extraction of Copper Splinter From the Vitreous.

HIPPEL (*Klin. Monatsbl. f. Augenheilk.*, July, 1913) adds nothing to the subject in this paper, but merely justifies certain of his previous statements.

M. W. J.

The Combination of Puncture With Pressure Bandage in the Treatment of Retinal Detachment.

FEHR (*Graefe's Archiv. f. Ophthal.*, Vol. 85, Part 2; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, February 5, 1914) reports his results with puncture followed by a firm pressure bandage in thirty-three cases. Vitreous injections were never resorted to. The cases operated upon included many apparently hopeless ones. In ten cases there seems a likelihood of a permanent cure, and in six cases the retina has remained attached over a year.

A. C. S.

Asepsis of the Hands.

ELSCHNIG (*Klin. Monatsbl. f. Augenheilk.*, June, 1913) advocates the use of rubber gloves in all bloody operations in which sutures are introduced or in which the fingers may come in contact with the wound.

M. W. J.

Hand Protection in Septic Operations.

BRUENIG (*Muench. med. Woch.*, 1913, No. 31; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, February 5, 1914) has used boric vaselin as a hand protection in septic operations. This thin layer of vaselin prevents the entrance of bacteria into the skin. Washing the hands in hot water will remove all bacteria and enable the operator to proceed with any aseptic case.

A. C. S.

The Treatment of Vernal Catarrh.

OHLEMANNS, Wiesbaden (*Woch. f. Ther. u. Hyg. des Auges*, February 26, 1914), recommends electrolysis in the treatment of vernal catarrh. The operation is painful and general anesthesia often necessary. Cocain may suffice if one begins with a very weak current, gradually increasing to fifteen milliamperes. The platinum needle of the negative pole is inserted into the base of the granulation and allowed to remain until the characteristic foam disappears. The granulation itself is then pierced radially three or four times, four punctures generally being required for a granulation of moderate size. Duration of treatment, twenty minutes. Three or four granulations may be treated at one sitting. The eye is bandaged for two or three days; reaction is very slight. The finest needles should be used and only one-half milliampere current applied at the start. The treatment should not be repeated until after the disappearance of symptoms of reaction.

A. C. S.

Wassermann's Histopin Ointment in Ophthalmology.

HAMBURGER (*Klin. Monatsbl. f. Augenheilk.*, June, 1913). Histopin is an extract made of staphylococci for the purpose of producing local immunity. Hamburger has gotten excellent results with this remedy in infections of the lid, conjunctiva and cornea. He has used it with preliminary cocainization for conjunctival and corneal conditions.

M. W. J.

Influence of the Alkaloids of Quinin on Pneumococcic Infections of the Cornea in Rabbits.

GINSBERG AND KAUFMANN (*Klin. Monatsbl. f. Augenheilk.*, June, 1913) proved that a one-half per cent solution of ethylhydrocuprein hydrochloricum has a strongly bactericidal action on intracorneal pneumococci, and is thus a pronounced curative agent. They also found that the remedy is not injurious to the tissues. In this strength the remedy was used subconjunctivally.

M. W. J.

Beginning Panophthalmitis Cured by Diphtheria Serum.

MOHR (*Pester med. chir. Presse*, 1914, No. 9; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, April 2, 1914). Two days after the extraction of a steel particle there occurred purulent

iridochoroiditis associated with pain in the head and eye, lid edema, chemosis, hypopyon, posterior synechiae and vitreous opacities. Besides local treatment the patient received three injections of 1500 J. E. diphtheria serum. Six weeks later vision had improved from counting fingers at one meter to 5/15.

A. C. S.

The Effect of Naphthol Upon Human, Animal and Fetal Eyes.

VAN DER HOEVE (*Archiv. f. Ophthalm.*, Vol. 85, Part 2; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, February 5, 1914). The results of numerous experiments, chiefly on rabbits, show that even small doses of naphthol act injuriously upon the retina and to a less extent upon the lens. After poisoning with naphthol retinal changes were much less pronounced in the eyes of the mother than in the eyes of the young, which suggests that a certain amount of caution should be exercised in prescribing drugs for pregnant women.

Examination of patients in the skin clinic who had been treated with naphthol ointment revealed the presence of retinal and lenticular changes which, however, did not result in permanent injury to the eye.

A. C. S.

Observations on Color Testing.

STELLING (*Centralbl. f. prakt. Augenheilk.*, March, 1913) insists that anyone who fails to recognize the pseudoisochromatic charts of his designing is defective as regards recognition of colors and should not be permitted to hold railway or marine positions.

M. W. J.

Xanthopsia Due to Misuse of Santonin.

YAMAGUCHI (*Klin. Monatsbl. f. Augenheilk.*, July, 1913) observed a thirty-eight-year-old male who in two days had taken the equivalent of 0.5 y. (gram ?) of santonin and was then afflicted with xanthopsia for about five weeks. The treatment comprised potassium iodid, cathartics, sudorifics and rest.

M. W. J.

A New Instrument for Measuring the Distance of Lenses From the Surface of the Cornea.

SPANYOL (*Klin. Monatsbl. f. Augenheilk.*, June, 1913) considers his instrument especially valuable in prescribing cataract glasses or Hertel's telescopic lenses where it is necessary

to place the glass within 1 mm. of the exact distance from the cornea. The device consists of a 2 mm. thick circular disc 35 mm. in diameter. In the center there is a 4 mm. circular opening. The second portion is a 4 mm. rod, 45 mm. long, marked off in millimeters. This rod is threaded so as to work smoothly in the disc first described. The disc fits into the usual trial frame, and after the eye is anesthetized with a single drop of holocain (1 per cent) the rod is brought into contact with the cornea and the reading taken.

M. W. J.

A New Cystotome.

TUERK (*Klin. Monatsbl. f. Augenheilk.*, June, 1913) has devised an instrument which has a small bellied blade at its end. He believes that the presence of a small blade assures the operator a clean cut opening in the lens and obviates the possible danger of dislocating it.

M. W. J.

Should a Patient Be Told of His Threatening Blindness and Its Incurability?

HOOR (*Centralbl. f. prakt. Augenheilk.*, April, 1913) believes that while one patient cannot be told, another can, and still another must be told. He believes the physician must solve the problem for each individual case.

M. W. J.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

BY

M. W. FREDERICK, M. D.,

SAN FRANCISCO,

AND

JESSE S. WYLER, M. D.,

CINCINNATI.

The Relation of Family Affections of the Optic Nerve to Those of the Nervous System.

FRENKEL, H., Toulouse (Sur les relations des affections familiales du nerf optique avec celles du système nerveux, *Archives d'Ophthalmologie*, Vol. XXXIII, November, 1913, p. 661), in a long, exhaustive article, full of references, comes to the following conclusions:

1. There are several types of family optic atrophy, just as there are numerous types of family affections of the nervous system. Some are hereditary, as Leber's disease; others limited to one generation. The latter, under the aspect of simple, nonneuritic atrophies, seem to have the tendency to associate themselves in the same individuals with the family affections of the nervous system. There is but one case on record in which Friedreich's disease was associated with an hereditary atrophy, and also but one in which Leber's disease was associated with a family affection of the nervous system, and even this in but one generation.

2. The organic affections of the nervous system which have the name of rarely giving rise to isolated optic atrophies, are, on the other hand, often amongst those which, in the hereditary or family form, are often accompanied by optic atrophy in several members of the family. Again, in the numerous affections which give rise to isolated optic atrophy (tabes, multiple sclerosis), it is rare to find both diseases occurring in more than one member of the same family.

3. The nonhereditary familial affections begin often in early life ('Tay-Sachs' disease, retinitis pigmentosa, simple atrophy). The very gravity of these conditions explains, in part, why they are not observed in several generations. The family and hereditary conditions begin in adolescence and early adult life (Leber type), and are much more benign. The later the affection appears in life the better the prognosis and the greater the possibility of a cure.

4. Consanguinity seems to play an important part in the etiology of families presenting an association of cerebrospinal localizations with lesions of the optic nerve. In eleven families analyzed, six presented this etiologic factor.

5. Infection and inflammation do not seem to play any role in the diseases mentioned. Leber's disease, which is in reality a retrobulbar neuritis, has, with the exception of Behr's case, nothing to do with the syndrome under consideration. Jendrassik's term "family degeneration" seems to characterize the nature of the process of this syndrome.

6. In 'Tay-Sachs' disease the family degeneration affects both the central and peripheral neurons, that is, the centrifugal and centripetal protoneurons, whence it spreads to the deutero-neurons. The lesions of the cortical neurons produce the spastic syndrome and the mental clouding so frequent in these cases, just as the lesions of the centripetal neurons explain the macular changes in 'Tay-Sachs', and the retinitis pigmentosa in the author's case. By analogy, one might assume that the optic atrophy in the other cases analyzed might proceed from the cellular lesions of the retina, without being able to derive any help in settling the question from the most rigid ophthalmoscopic examination.

M. W. F.

Diagnosis of Traumatic Opacities of the Lens Without Dehiscence of the External Membranes.

PRÉLAT (Diagnostic des opacités traumatiques du cristallin sans plaie des membranes externes, *Archives d'Ophthalmologie*, Vol. XXXIII, November, 1913, p. 692). These opacities are produced either by contusion, such as a blow with the fist, a ball, a cork, etc.; or by commotion, such as a fall on the head or the buttocks. Opacities due to tetanus and electric discharges are not considered. The opacities are either cataract-

ous, i. e., they are permanent and disappear with the resorption of the lens; or they are transitory, being a sort of interstitial edema, and disappear, leaving the lens intact. The loss of vision may often seem unexplained until the pupil is well dilated, when equatorial opacities will be found. The differential diagnosis between permanent and transitory opacities is called for, *eo ipso*, in recent cases only. If no rupture of the lens capsule can be made out, and the opacity has appeared suddenly, without being dense enough to make the seeing of the fundus impossible, it is very likely that we have a transitory opacity, which will clear up in a short time, especially in a young subject. Two weeks to two months is about the time required for the clearing of these transitory opacities; and in some cases, where we have both kinds together, the clearing will go to a certain point, where it stops. Caudron recites a case in which the clearing up process extended over four months, but this is the longest case on record, so that one may safely assume that any opacity existing after six months is permanent. On the other hand, a rapid clearing up of the lens does not warrant the assumption that we are dealing solely with a temporary opacity, as there may be a slowly progressing permanent opacity due to a rupture of the lens capsule, which becomes evident later on. That a sudden improvement in vision does not mean a clearing of the lens is well illustrated by a case of Desmarres, in which a cataractous subject, on kneeling with great energy and fervor, suddenly found her vision restored: her lens had become luxated into the vitreous. A similar occurrence was observed by Terson in a peasant who fell from a tree.

Medicolegally, given a permanent opacity, one has to decide whether the opacity is really due to the shock, as alleged, or is an old standing one. On the other hand, an opacity may declare itself long after a trauma which seemed trivial at the time. A large number of cataracts appearing in subjects less than fifty years old are probably of traumatic origin. Panas insisted on the "monocularity" of traumatic cataracts, but this rule cannot hold against the known cases where opacities in both lenses have been caused by a commotion.

A visible lesion of the lid does not necessarily mean that the lenticular opacity is of synchronous origin. One should also guard against the cataracts due to faulty diathesis, espe-

cially diabetes, and the urine should be examined in all cases. One should also look carefully for signs of a previous inflammation which might give rise to the opacity.

If a dehiscence of the capsule has taken place, one may hope for a spontaneous resorption of the opacity, especially in young subjects. If there is no capsular dehiscence the opacity progresses slowly and uniformly, and is never absorbed without surgical intervention.

M. W. F.

A New Model Double Prism.

LANDOLT, E. (Le double prisme, nouveau modèle, *Archives d'Ophthalmologie*, Vol. XXXIV, February, 1914, p. 65) describes a new double prism, which has the advantage over the prism of Crêtès in that it permits of continuous rotation, whereas Crêtès' instrument allows an excursion of 90° only. This instrument makes it possible for one to dispense with the set of prisms in the trial case, and also enables one to determine with the greatest precision the amount of strabismus, the latent deviations, and facultative divergence.

M. W. F.

The Fistulizing Method in the Cure of Chronic Glaucoma—Comparative Values of the Different Operative Procedures.

LAGRANGE, F., Bordeaux (De la méthode fistulisante dans la cure du glaucome chronique. Valeur comparée des divers procédés opératoires, *Archives d'Ophthalmologie*, Vol. XXXIV, February, 1914, p. 71), adds another article to the many which he has already written on this subject. As corneal tissue tends to reform, whereas scleral tissue shows no such tendency, the excision should take place wholly in scleral tissue—that is, in the scleral part of the limbus—carefully avoiding the sclerocorneal part of the limbus and the membrane of Descemet. This scleral part of the limbus is in juxtaposition to a richly and loosely reticulated conjunctiva, whereas the conjunctiva overlying the sclerocorneal part of the limbus has become reduced to a thin layer poorly adapted to the protection of the wound. This scleral limbus has a width of barely one millimeter, so that the excised piece must be somewhat narrower than one millimeter, and may have a length of two to three millimeters. This makes the use of a trephine impossible, and the taking away of a circular piece irrational.

Comparing Holth's operative method with his own, the author concedes the superiority of Holth's method in the better conjunctival flap and the smallness of the scleral opening; on the other hand, it never results in a section of the ciliary tendon, and there is danger of producing a traumatic cataract. Using a narrow Graefe knife, and keeping close to the iridic root, Lagrange is able, in many cases, to cut through the ciliary tendon, and thus give relief in those cases where the glaucoma is associated with a chronic choroidal lymphangitis. This mode of establishing a communication between the choroidal spaces and the anterior chamber is without danger, as the ciliary tendon does not contain any nervous elements which might respond with an inflammatory reaction. Using Elliot's trephine one would not dare to go far enough back to cut the ciliary tendon, on account of the great danger of wounding the lens. The cutting out of a scleral strip with the punch is without danger.

Lagrange limits his operation to cases of simple chronic glaucoma with constant or intermittent hypertension. In acute cases, or in cases with a tension of $+3$ or more, the attendant risks are the same as in doing an iridectomy. Lagrange objects to Moeller's unfavorable criticism of his method, because Moeller used Lagrange's method in thirty-six cases of acute and absolute glaucoma. If these cases are eliminated, Moeller had but five bad results in three hundred and forty-seven eyes, and Moeller's enumeration of the accidents to be feared with Lagrange's operation, such as opacity of the lens, severe iridocyclitis with atrophy of the globe, expulsive hemorrhage, is to be viewed in the light of unwarranted and unfriendly criticism. Lagrange admits only 6.7 per cent of failures in chronic glaucoma, and 4.4 per cent in simple glaucoma.

Lagrange, furthermore, claims that to make a just comparison of the results in the two methods, one should state the time that passed since the operation. He does not include in his statistics operations that are less than one year old, whereas the others give the results after as short a time as two months. Time alone can give dependable values; even iridectomy and sclerotomy will reduce the tension for a few months.

M. W. F.

Topographic Anatomy of the Sclerocorneal Limbus—The Best Method of Performing a Sclerectomy.

LE MAGOUREU, Bordeaux (De l'anatomie topographique du limbe scléro-cornéen. Du meilleur procédé pour faire une sclérectomie, *Archives d'Ophthalmologie*, Vol. XXXIV, February, 1914, p. 85). This article is but an anatomic substantiation of Lagrange's method, and contains nothing new. Were it not for the photographs, which are good, there seems but little reason for admitting it to print. M. W. F.

Nasolacrimal Hyperostoses of the Face and Forms of Leontiasis Ossea in Congenital Syphilis.

ANTONELLI, Paris (Hyperostoses naso-lacrymales et de la face, formes de leontiasis ossea dans la syphilis congénitale, *Archives d'Ophthalmologie*, Vol. XXXIV, February, 1914, p. 100), reported to the International Congress in Budapest, in 1909, his findings of exostoses of the free borders of the nasal bones, and signalized them as amongst the most frequent stigmata in congenital syphilis. Since then he has observed the same process in the body of the nasal bones, the ascending branch of the maxillary bone, and sometimes of the cheek-bone, giving a picture closely resembling the leontiasis ossea of Virchow. Two cases are described: in the case of a girl of sixteen years the father was free from lues, but the mother bore the marks of hereditary syphilis. The girl became absolutely deaf after bathing in the surf. Five years later the left side of the nose became noticeably enlarged, and a year later the right side was also considerably enlarged, all the bones concerned in the formation of the nasal skeleton being much thickened. The second case was that of a woman of twenty-seven years, in whom the hyperostosis was severe enough to produce a complete stenosis of both nares. In the first case the Wassermann test gave a positive result, but in the second case the result was negative with Wassermann, although positive with Desmoulière's antigen. (Antonelli remarks that this is frequently the case with hereditosyphilitic adults. Desmoulière's antigen is powdered liver from which the fat has been extracted with ether, and to which cholesterin has been added.)

M. W. F.

Does a Natural or Acquired Immunity Against Trachoma Exist?

MEYERHOF, M., Cairo (Existe-t-il une immunité naturelle ou acquise contre le trachome? *Revue Générale d'Ophtalmologie*, Vol. XXXIII, No. 4, April, 1914, p. 145). Swan Burnett's opinion that trachoma is exceedingly rare amongst the negroes of North America was confirmed by Lucien Howe and Finlay. Milligen, of Constantinople, however, found a large number of negroes in the Turkish capital suffering with trachoma, and the Egyptian oculists found the same. Trachoma attacks all the white and black races that have collected from all parts of the world in the valley of the Nile. Although not as frequent as in Egypt, trachoma exists in Nubia, the Soudan, Abyssinia, and even in Central Africa. There is, therefore, no racial immunity against trachoma, and this applies to Chibret's opinion as to the immunity of the Celtic race.

Granted the lack of racial and individual immunity, some authors pretend that an eye that has escaped infection acquires a certain immunity from its infected fellow eye. This condition is extremely rare, and the diagnosis of immunity is to be brought only after a searching examination with the loupe for minute scars in the conjunctiva and remnants of pannus in the cornea. In private practice Meyerhof found seven cases amongst 2,828 trachoma patients, and in 6,000 clinic cases but two. Three cases are described in which a late infection of the seemingly immune eye took place.

Neither does infection with trachoma procure immunity after the trachoma has been healed, as shown by further cases in which reinfection took place after twenty, two and four years. Serotherapy is of no value against trachoma, vaccino-therapy and chemotherapy being the weapons to use against the still unknown infectious agent. M. W. F.

Recovery From Panophthalmitis Due to Traumatic Perforation of the Cornea Followed by Infection.

RUTTEN, Liège (Rétrocession d'une panophtalmite a la suite d'une perforation traumatique de la cornée suivie d'infection, *Bull. de la Soc. Belge d'Ophtalm.*, Nos. 37 and 38, 1914, p. 15). A boy aged fourteen years was struck in the left eye by a rather large fragment of iron, which, after perforating the cornea in the superointernal quadrant, fell to the ground. On

the following day an injection of Roux's serum was given, and the following day an enucleation was proposed. Rutten saw the patient the same day and noted marked symptoms of panophthalmitis, with well advanced cataract, and vision reduced to projection of light. Rutten decided to make an attempt to save the eye: the patient received mercurial inunctions over the entire body and three grams of potassium iodid a day. The result was almost immediate: on the third day the pus had disappeared from the anterior chamber, and the lens was practically clear on the ninth day. On the sixth day the iris tissue had reassumed its normal appearance, and the few synechiæ present had yielded readily to atropin. On the tenth day the iris had resumed its normal function and the cornea had entirely cleared up. On the fifteenth day the eye was normal in all respects, the vision 6/6, field normal, and only a slight scar in the cornea remained to remind one of the accident.

(To those who have used the same therapeutic measures in identical cases, Rutten's results must seem indeed wonderful: and those who have followed French methods and are inclined to be skeptical, would rather attribute the result in this case to the injection of Roux's serum, which, in former excerpts in this department, has been well spoken of in this condition, rather than to the measures adopted by Rutten.—Ed.)

M. W. F.

Ocular Mycoses.

LANDRIEU, M. (*Les mycoses oculaires, Thèse de Paris*). Fungi, which the discoveries of Gruby, Charles Robin, and Virchow, introduced into human pathology, have assumed a new importance through the studies of Buermann and Gougerot. In ophthalmology A. von Graefe and Leber were the pioneers, but Morax and his pupils have shown that even the most modest of oculists cannot afford to ignore the biology of these "fungi imperfecti." As a rule the diagnosis can be made from the clinical signs, but if they are not sufficient, a microscopic examination of an uncolored or stained smear, or of a culture, will tell the tale. Further study in the hanging drop, in different culture media, etc., is to be commended.

The number of ocular mycoses mentioned in literature up to the present time is rather restricted, due, no doubt, to the fact that the attention of oculists has not been called to this

pathologic feature. Nevertheless, nineteen cases of aspergillus keratomycosis, twenty cases of ocular sporotrichosis, one case of keratomycosis due to "verticillium graphii," two cases of conjunctival thrush, and several cases of blastomycoses, several cases of ocular ringworm, and of palpebral and orbital actinomycosis, twenty-three cases (in French literature) of lacrimal concretions, and one case of mycosis of the conjunctiva due to "Noacardia dassonvillei" have been recorded.

M. W. F.

Neosalvarsan in Ophthalmic Therapy.

FRADKINE (Le néosalvarsan en thérapeutique ophtalmologique, *La Clinique Ophthal.*, January and February, 1914) draws the following conclusions, many of which differ radically from the findings of other investigators:

1. Arsenobenzol is the medicament of choice in ocular syphilis in all stages, particularly where mercury has proved unavailing.

2. No matter what the clinical aspect may be, or the serum reaction, use salvarsan if the condition resembles lues, and if unsuccessful, combine with Hg. and K. I.

3. Not one observation proving destruction of the optic nerve has been published.

4. Successive small doses at intervals, increasing up to the maximum, has a better sterilizing effect than the one massive injection.

5. The accidents following the administration have various etiologies: Sometimes due to anaphylaxis, sometimes it is a Herxheimer reaction, and sometimes it is a manifestation of an anterior pathologic state.

6. It is preferable to make an isotonic solution with a small amount of water.

7. Intravenous injection are alone rational and efficacious.

8. Affections of the adnexæ of the eye, primary, secondary or tertiary, are rapidly cured with neosalvarsan.

9. Parenchymatous keratitis of recent origin is favorably influenced.

10. Iritis, iridocyclitis, choroiditis and acute chorioretinitis show a rapid and complete recovery.

11. In glaucoma secondary to a syphilitic lesion, and even in sympathetic ophthalmia, it is worth while to try arsenobenzol.

12. The actions of salvarsan and neosalvarsan are interchangeable. The only difference is in the dosage.

13. In a general way, ocular affections, acute and recent, are happily influenced by arsenobenzol.

The rapidity of its action and the certainty of a result make it superior to mercury and the iodids. Nevertheless, a combination of these three specifics will render much service in certain cases.

J. S. W.

Interference in Traumatic Cataracts.

Jocos, R. (De l'intervention dans les cataractes traumatiques, *La Clinique Ophthal.*, February, 1914), asks the question as to the necessity of operating in these conditions, and quotes several reports for and against. The author reports in detail a case injured by a foreign body on the 19th of July, with extraction of the particle the following day. Soft cataract was completely formed by the end of October. He operated three months after the injury, and complete healing resulted four months from the date of the accident, which is a fairly long interval, despite intervention. How long would it have taken for spontaneous absorption? Certainly a much longer period, although the results would have probably been the same, and the patient is unquestionably entitled to as rapid a recovery as possible.

J. S. W.

Advancement of the Conjunctiva in Cataract Extraction.

CONSTANTINESCO, Bukarest (Sur l'avancement de la conjunctive dans l'extraction de la cataracte, *La Clinique Ophthal.*, February, 1914), remarks upon the various means adopted to prevent postoperative infection, and believes that drawing the conjunctiva over the corneal wound has given exceptional results in the Bukarest clinic. The author claims that other oculists have employed this measure for other ocular affections, as corneal fistula, ulcer, and prolapse of the iris. Also Abadie, Darier, Dupuy-Dutemps and Van Lint for postoperative infections, but none have used it as a prophylactic measure. (Kuhnt in 1905, and Webster Fox in 1906, were advancing the conjunctiva, to my personal knowledge.—Ed.) The writer began in 1911, and up to June, 1913, had operated seventy-five cases without the slightest infection; of these, twenty-seven were the Stanculeano intracapsular method. The

conjunctival incision is close to the limbus, except at the ends, which may extend out a few millimeters: the membrane is undermined and the sutures are placed in position exactly as described by Fox. The complications may be:

1. Insufficient dissection of the conjunctiva.
2. Cutting into the flap.
3. Faulty insertion of the sutures.
4. Breaking of the suture through rough handling.

The only objections to the performance of the sliding flap operation are the increase in time required and the interference with the corneal incision through the sutures in place.

The entire article is a thorough exposition of a well known procedure.

J. S. W.

Contribution to the Medicolegal Study of Traumatic Paralysis of the Ocular Muscles.

BAUDRY, Lille (Contribution à l'étude médico-légale des paralysies traumatiques des muscles de l'oeil, *La Clinique Ophthal.*, February, 1914). This work is based upon one hundred and fifty observations to determine the consequences to sight and efficiency of permanent and temporary paralysis. The causes which produce this condition are briefly mentioned:

1. Paralysis following skull injuries, either through direct crushing or from presence of a hemorrhage. The crossing of the motor nerves over the cavernous sinus explains the complete ophthalmoplegia which accompanies arteriovenous aneurisms.

2. Paralysis following injuries to the orbit or face. In this group the nerve may be injured or the muscle or tendon itself may suffer. The foreign body itself may cause a mechanical impediment.

The prognosis and medicolegal consequences depend upon:

- (a) The anatomic and pathologic lesions which caused and which accompany the paralysis, with their possibility of healing.

- (b) The profession of the injured.

- (c) The state, both anatomically and functionally, of the injured eye, and the condition of the other.

In general, paralysis of traumatic origin furnish a favorable prognosis, the exceptions being those which follow tear-

ing of the nerve, meningitis, bony pressure and tearing of muscles and tendons. However, late results furnish many surprises: as loss of convergence, following many months after an injury to the superior oblique. At times the diplopia disappears, leaving a strabismus or faulty projection. Little by little a cerebral neutralization reeducates the muscles to recognize the position of objects. The vertigo is aggravated in climbing the stairs or descending a ladder, which is a serious obstacle to painters, sailors, mechanics, etc. Although these troubles disappear if the paralyzed eye is covered, the loss of binocular vision is of great consequence.

Oculomotor paralyses have variable consequences, depending upon the muscles involved, as in jewelers, miners, drivers, who all have need of different sets. Ptosis impairs some and does not affect others. Temporarily, during the diplopic stage, the occlusion of the eye makes the paralysis equivalent to the loss of sight. Even when corrected by prisms or position of the head, the reduction in value of the work is from 5 to 15 per cent. Traumatic mydriasis with paralysis of accommodation, frequent after contusions to the globe, causes from 10 to 100 per cent depreciation, according to the occupation. When the diplopia persists the reduction is from 25 to 100 per cent. The loss of professional capacity is variable, depending upon the trade of the injured, the number of paralyzed muscles, the degree of paralysis, etc.

There is a pseudoparalysis of the muscles of the eye, the uncovering of which plays an important role. This is done by means of prisms, colored glasses and the diploscope. It is impossible to simulate a strabismus for any length of time. Mydriasis may be artificially produced. Blepharospasm which simulates ptosis is recognized by the muscular contraction of the orbicularis.

J. S. W.

ABSTRACTS FROM SPANISH OPHTHALMIC LITERATURE.

BY

WILLIAM H. CRISP, M. D., OPH. D. (COLO.),

DENVER.

Interstitial Keratitis.

SANTOS FERNANDEZ, J., Havana (*Archivos de Oftalmologia*, January, 1914), has seen two hundred and three cases of interstitial keratitis in females, and 184 in males. In two hundred and fifty-four cases both eyes were attacked at the same time. Forty-five patients had severe pain; fifty-three intense photophobia; forty-three abundant lacrimation; and forty-six exaggerated conjunctival injection. There was a definite iritis in fifty cases. In only one instance was there good reason to believe that trauma had influenced the development of the disease. As regards age, fifty-two patients were between two and seven years; one hundred and twenty between seven and twenty; ninety-seven between twenty and thirty-five; thirty-five between thirty-five and forty-five; and eight over forty-five years of age. As against eighteen cases in which there was extreme vascularity of the cornea, in fifteen there was entire absence of vascularity.

Multiple Fibromas of the Conjunctiva.

LEOZ ORTIN, G. (*Archivos de Oftalmologia*, January, 1914). A man of twenty-nine years, from whose left eye a large staphyloma had been resected, wore for a long time a poorly fitting prosthesis, in spite of the fact that symptoms of irritation were constantly present. When he came for examination there were three papillomatous excrescences of the conjunctiva, one starting above near the inner canthus, one above near the outer canthus, and a third, much the largest, reaching

from the external commissure to within 8 mm. of the caruncle. The growths, which were quite hard, proved on microscopic examination to be simple fibromata.

Prepapillary Arterial Cord Penetrating Into Vitreous.

MARQUEZ, M., Madrid (*Archivos de Oftalmologia*, January, 1914). The cord consisted of an artery doubled on itself, and protruding eight diopters into the vitreous. One column of the vessel was coiled seven or eight times around the other.

Primary Syphiloma of the Palpebral Conjunctiva.

PANNUNZIO, MAURO (*Archivos de Oftalmologia*, January, 1914). A girl of fifteen years came on account of a swelling inside the upper lid, which proved to be an ulcer on a hard base in the upper conjunctival fornix. Prompt cure under mercury, and later microscopic examination of smears made from the ulcer, proved the syphilitic character of the lesion.

Diffuse Orbital Cellulitis.

SCHLEISINGER, FERNANDO S., Rosario de Santa Fe, Argentina (*Archivos de Oftalmologia*, February, 1914). The patient was a poorly nourished boy of nine years, who came for examination twenty days after the beginning of his sickness. The temperature had not exceeded 101° F. There were persistent constipation, vomiting, and intense headaches. The right eye was slightly exophthalmic, and the vision in this eye was abolished. The fundus appearance was that of a neuroretinitis from retroocular compression. The cerebral and local symptoms (edema of the orbit and lids) became worse for same days. Exploration of the orbit in all directions with a long fine trochar gave vent to nothing but blood. A long deep opening was made in the inferior cul-de-sac, and the wound was packed with a gauze drain reaching almost to the apex of the orbit. The general condition of the patient improved steadily from this time, although at each change of dressing the only discharge was of bloody serum, without any trace of pus. The eye gradually recovered its normal position and movements; but the vision was not restored, the disc becoming distinctly atrophic.

Dyscrasic Hemorrhage in the Vitreous.

SAL LENCE, Corunna (*Archivos de Oftalmologia*, February, 1914). The patient, a man of forty-two years, was the hemophilic son of a hemophilic father. He had had one nasal hemorrhage which had lasted eight hours in spite of all means used to stop it. One morning he found his right eye suddenly blind. The vitreous contained a large hemorrhage, which gradually cleared under treatment with potassium iodid and chlorid of calcium internally, and pilocarpin locally (on account of slight temporary rise of tension).

Blennorrhagic Iritis With Fourteen Recurrences.

GARCIA MANSILLA, D. SINFORIANO, Madrid (*Archivos de Oftalmologia*, February, 1914). The fourteen attacks of acute serous iritis occurred at irregular intervals in the course of six years, beginning when the man was thirty-two years old. Special diagnostic methods disclosed the presence of gonococci in the secretion from a chronic prostatitis.

Diagnosis and Correction of Biastigmatism.

MARQUEZ, M., Madrid (*Archivos de Oftalmologia*, March, 1914). In this paper, which was actually read last year before the Seventeenth International Medical Congress in London, the author returns to the charge on the subject covered by previous articles (see ANNALS OF OPHTHALMOLOGY, Vol. XXII, p. 167). He regards himself as having discovered that biastigmatism is produced when the two principal meridians of corneal astigmatism and those of the "remaining" astigmatism do not coincide; and he makes its diagnosis by using two cylindric glasses whose axes are oblique to one another, one of which corresponds to the indication obtained from the ophthalmometer. He argues that in some cases the prescription of a bicylindric combination is preferable.

Angiomatous Tumor With Exophthalmos.

SANTOS FERNANDEZ, J., Havana (*Anales de Oftalmologia*, March, 1914). The patient, then a girl of eight years, was first seen in 1905, when she stated that for some time she had not seen with the right eye. The right optic disc was atrophic

and the eye had not even light perception. A diagnosis of incipient tabes was made. Some time later the development of exophthalmia of this eye suggested a diagnosis of orbital tumor. Five years passed without much change. Another surgeon made a diagnosis of orbital sarcoma, and a third of venous tumor. In 1912 the patient, who lived at a distance, returned with the statement that she had had a profuse discharge of bloody fluid from the right side of the nose, which had been followed by reduction of the exophthalmos. A rhinologist decided that the blood came from the maxillary sinus. Further reduction of the exophthalmos was produced by orbital puncture and aspiration of a large quantity of bloody fluid at the external canthus. The eye was therefore not enucleated.

ABSTRACTS FROM ITALIAN OPHTHALMIC LITERATURE.

BY

J. HERBERT CLAIBORNE, M. D.,

NEW YORK.

Surgical Cure of Hypopyon Keratitis.

CIRINCIONE (*R. Clinica Oculistica di Roma*, January and February, 1914). The experimental researches of Caladera on keratitis of miners, continued by me on man and animals, justifies the following conclusions:

1. The germ in pure culture of the secretion of the conjunctiva or lacrimal sac, likewise of the detritus of the corneal ulcer with hypopyon, when inserted into the sound cornea, did not form a typical ulcer with hypopyon, but a grayish infiltration, more or less intense, which, when restricted to the superficial strata, caused loss of substance; the prognosis of which was always favorable. Recovery takes place in from ten to twenty days. The result is not modified by the instillation into the conjunctival sac of the pure culture of diplococcus or staphylococcus.

2. The intensity of the corneal infiltration is proportional to the quantity of the inoculated culture, but not altogether to the quality of the germ; it bears no relation to the medium on which the culture is grown.

3. In one case in which the cornea was completely insensible, the same result occurred, but when the inoculation was repeated at another point of the cornea with the same diplococcus, and a drop of the culture of the diplococcus was instilled every two hours, the result was a purulent corneal ulcer with hypopyon, the course of which was identical with that of the usual clinical form. In five days numerous staphylococci appeared, and the diplococci had almost entirely disappeared.

4. In animals experiments were negative (rabbits). Se-

rious ulcers occurred only in some of those the ciliary and optic nerves of which had been cut behind the globe, anemia being thereby produced. All had been injected with strong doses of chlorid of quinin in the veins while at the same time virulent microbial material had been allowed to remain in the conjunctival sac.

From his studies of serpiginous ulcers the author has drawn the conclusion that the greatest danger to the corneal integrity is caused by secondary infection with conjunctival and lacrimal secretion of the ulcer. He considers the microbial infection to be secondary, and the corneal tissue is rendered more vulnerable to the microbe by a fungus, ordinarily the streptothrix.

In the experiments on animal and human cornea the fungus is met exceptionally after the third day. The action of this fungus is to produce an albuminous toxic substance which has the power of destroying an almost microscopic point on the corneal tissue and infecting the lower layers through this means. He has produced with acids and alkalies microscopic points on the cornea, and microbial invasion occurs at once after the eschar commences to be thrown off.

In consideration of these results, he thinks it justifiable to draw the conclusion that the gravity of the disease depends upon the continuous infection by virulent germs contained in the conjunctival sac, favored by lack of vitality of the corneal tissue. To some extent the vulnerability of the cornea to the infection is due to increase of tension, which is constant in the first days of the disease.

Whoever can succeed in protecting the corneal focus from contact with the conjunctival secretion, and can succeed in increasing the lymphatic intraocular circulation and that of the corneal lamellæ, will discover the best remedy against this very grave disease.

The method of procedure which the author has adopted and used successfully is that of Prof. Cirincione, as described in his lectures and demonstrated in the Clinica di Roma.

First, after having cleansed the conjunctival, likewise the lacrimal apparatus, he cauterizes with electrical cautery.

Second, cuts the conjunctiva around the cornea.

Third, trephines the globe at the sclerocorneal limbus by the method in use in his school.

Fourth, sutures the conjunctiva over the cornea, so that the threads do not touch the cornea and the raw edges of the conjunctiva come in contact.

He maintains that the pain ceases quickly, and that the patient does not need any special care for ten days. About this time the conjunctiva slips back to the limbus, and the patient is on the road to complete recovery.

(The views expressed in the above tally singularly with my own. For thirty years I have used nothing but actual cautery in treating ulcer of the cornea, whether serpiginous ulcer, ordinary infected ulcer, or rodent ulcer. I have even on many occasions destroyed points of infiltrations and phlyctenulæ by this means. I cannot understand how anyone can waste time using any other methods.

The contention that an opacity always follows actual cautery is not true. At times a small opacity or plaque may be left when the burning has been very deep, or has been repeated a number of times. I have frequently observed that the corneal tissue, even the epithelium, has apparently been restored, and often I have not been able to detect any irregularities whatever on the corneal superficies.

I have tried both the natural and electric cautery, and pronounce unequivocally in favor of the former.

I use the probe invented by Dr. Gruening in 1885. It consists of a platinum point attached to a slender steel shank, mounted upon a delicate handle. The probe is heated to a white heat in a spirit lamp, and transferred rapidly to the ulcer. If done with promptness, celerity and dexterity, the point is glowing red by the time it touches the cornea, and a classical result is obtained. If, however, the surgeon does not possess the necessary celerity and dexterity, irritation is produced. I think this accounts for some of the objections which have been made to it.

The electric cautery does not have this disadvantage, may be placed upon the cornea cold, and the current turned on later. I have used this method a great many times, but I have found the results following it not so good as those following the natural cautery. I attribute this to the radiation produced from the electric point, and to too great destruction of the corneal tissue.

In all my experience, clinical and private, there are but two

cases in which I failed to arrest the process at once. One was that of a confirmed drunkard, with an ulcer which I cauterized three times, but when the eschar began to fall off he was reinfected from the conjunctiva. He disappeared before his eye was destroyed, but I do not doubt that it was finally lost.

The other case was that of a young woman of lymphatic disposition, who contracted a serious inflammation of the conjunctiva in an ocean bath, followed by a circular ulcer at the apex of the cornea, $3\frac{1}{2}$ to 4 mm. in diameter. The secretion from the conjunctiva was ropy, profuse and acrid. Unfortunately it was not examined microscopically, as treatment had to be instituted at once.

I cauterized the entire ulcer, edges and center, destroying the infected area, without, however, rupturing the cornea. I used a 30 per cent argyrol and bichlorid solution for cleansing purposes (1/3000).

At the end of a week the ulcer had become smaller, the pupil was dilated about maximum, pain was absent, and I thought I could let the patient take care of herself at home, insisting, however, on the use of bichlorid.

I was supported in this conviction by the diminution of the conjunctival secretion.

In twenty-four hours she appeared at my office with the upper lid swollen, the eye fiery red, the pupil contracted, and the ulcer larger than it was at the beginning, with a raised infiltration at its circumference. At the same time the secretion had increased a great deal. The cornea had become reinfected because the eye was not kept free of the secretion. At the hospital it had been cleaned every hour, and three or four times during the night. Another cauterization was done, equally as thorough as the first. A few hours later the anterior chamber was evacuated, the iris was caught in the wound, and it was two weeks before the patient could leave the hospital.

She finally recovered with a large central leucoma adherens, with good light perception and projection. The scar has constantly contracted, and it will ultimately be possible to give her an artificial pupil downward and inward if necessary.

There is no doubt that this patient was reinfected from the conjunctiva, and this bears out the contention of the above author that cauterization is not enough, that the eye must be

protected against reinfection by sterilization, if possible, of the conjunctival and lacrimal sac.

I have never had an occasion to trephine the cornea, or to bind the conjunctiva over the ulcer, although this latter procedure has found favor among American surgeons in persistent ulcer, and even in the acute form,—J. H. C.)

Persistent Bradicardia Following Injuries of the Ocular Bulb.

GALLINGA (*Ottalmologia*, Vol. XX, Fasc. No. 11) has observed a persistent bradicardia following injuries of the ocular bulb, which, owing to its duration, cannot be put in relation to the phenomenon of traumatic stupor, because, as we know, this form resolves itself in a few hours, or within a day at least. The explanation of the above fact is to be looked for, according to the author, in the sudden and often complete lesion of the ciliary nerves, which lesion could very well cause a reflex action on the cervical sympathetic ganglion, thereby producing, through an indirect action, inhibition of the heart. The changes which occur in the ciliary nerves after a violent traumatism may, in part, explain the reflex changes occurring in the function of the sympathetic nerve in the neck and its relationship to the pneumogastric, producing on the one hand a depression of the sympathetic action on the heart; on the other hand, a species of excitement on the vagus nerve. This induces, therefore, a slowing of the heart action, which disappears only after the anatomic consequences of the lesions of the ciliary nerve on the rest of the sympathetic system have disappeared.

Alterations of the Eye in Senility.

ATTIAS (*Ottalmologia*, Vol. XX, Fasc. No. 2), using the most advanced mechanical and histomechanical means at our disposal, has found that the alterations of the eye in senility are due to fatty degeneration in the tissues of the bulb.

Calderaro has conducted a series of experiments with a view of establishing the influence of strychnin on the function of the retina, and has arrived at the following conclusions:

First: Strychnin does not increase the acuteness of light sense as regards the perception of minute differences between light and darkness, nor does it diminish the minimum ampli-

tude of the luminous aperture necessary for the perception of known degrees of light or clearness.

Second: It does not increase the direct visual strength, nor does it diminish the visual angle under which a test object is seen.

Third: It does not increase the visual field relative to a white object 10 mm. square.

Fourth: It does not displace toward the periphery of the visual field the limits for the discernment of distinct points.

Fifth: It does not increase the distance at which distinct points are discerned in direct vision in various degrees of the point of fixation.

Sixth: It does not increase the direct chromatic sense, and should slightly the indirect.

Seventh: It does not increase the limits of the chromatic visual field nor that of the chromatic sensibility.

Eighth: It simply brings the limits of these various retinal functions much closer to the normal oscillations: This influence is limited to the eye which has received the injection, and is observed only during the first two days after its application.

Ninth: The limitations of the tiring of the visual field and of the indirect visual strength is affected after a longer time than in a normal state, and this also in the eye that has received the injection and only during the first two days. From these results it must not be concluded that strychnin is inefficacious in certain pathologic conditions of the retina and of the optic nerve in the hypotonic form, inasmuch as it results from the above experiments that strychnin increases the tonicity of the visual elements of the retina, and, therefore, in all those maladies in which they become temporarily torpid, the action of strychnin must be almost as beneficial as an adequate electrical stimulation.

Clinical and Experimental Researches of Ocular Iontophoresis.

CALDERARI (*Ottalmologia*, Vol. XX), with a view of establishing the method of this treatment, has made a number of researches with the following results:

He has applied strychnin by the temporal and conjunctival route, by means of electricity, in conditions which affect the

retinal nerve elements and the fibers of the optic nerve, also applying this method in animal experimentation as well.

First: He claims that the electricity is a valuable means of introducing certain medicaments into the eye, especially those having electrolytic qualities, to which group strychnin belongs.

Second: Two ways can be selected for the introduction of these remedies, that is, the temporal and conjunctival.

Third: Through the skin of the temporal region the introduction into the eye of electrolytic substances is rather slight—nevertheless, increasing the doses gives the same therapeutic results as the injections in that region, and permits more numerous and continued applications and does not bring any alterations to the surface of the skin to which it is applied. To obtain the same curative action by means of injections of from 1 to 5 mg. of the alkaloid, it is necessary to employ 10 cc. of a solution of strychnin of one-half per cent and a current of 5 mp. for a duration of five minutes. This can be increased gradually to 10 mp. in a duration of ten minutes per sitting.

Fourth: Applied to the fornix of the conjunctiva, the electrical introduction of remedies is five times as great as in the temporal region. For such a purpose it is only necessary to introduce ten to twenty drops of a one-half per cent solution of strychnin on a layer of cotton which covers the branches of an ordinary blepharostat kept in contact with the positive pole of the galvanic current. This simple device is superior in many respects to the use of specially constructed apparatuses, because this allows the physician a direct and continuous observation of the cornea, as it is necessary that the instrument does not touch the same, as it could readily be injured. The applications should begin with a current of 1 mp. for one minute, increasing gradually from three to five minutes, without any fear for the eye, which can tolerate these continuous applications very nicely. The curative effects are equal to the subconjunctival injections made with a $\frac{1}{2}$ cc. of a 1 to 1000 solution of strychnin.

Fifth: Animal experimentation shows that the quantity of strychnin which penetrates the eye by the above means is very small, as it is also by means of the subconjunctival injections into the temporal region. In fact, it is almost necessary

to inject a fatal dose of strychnin in order to obtain by means of the ocular fluids a slight and transitory poisoning of the frog.

Sixth: The experiments with conjunctival iontophoresis demonstrate, on the other hand, the facility with which it penetrates the eye—in a few minutes a sufficient quantity of strychnin to poison the frog from the liquid which can be extracted from it.

Seventh: The electrical application of strychnin in the conjunctiva is indicated in all cases in which strychnin is prescribed, but is contraindicated in those cases with plastic inflammation and extravasations of blood in the intraocular membranes.

Eighth: The electrical application of strychnin does not eliminate the danger of the cumulative action of this drug.

New Method for the Operative Correction of Cicatricial Entropion of the Lower Lid.

BASLINI (*Ottalmologia*, Vol. XX, No. 12) applies tincture of iodine to the lid externally, then introduces the metallic spatula and executes three incisions as Panas does.

First: A horizontal incision through the skin, comprising the skin and orbicular muscle, 10 mm. from the ciliary margin and parallel to it across the entire length of the inferior lid. Two other lateral vertical incisions which begin at both angles of the eye (about 2 mm. from the free margin) till they reach the horizontal incision. This done, an intermarginal incision is made about 2 mm. deep, in order to separate the external musculocutaneous layer from the tarsoconjunctival layer, and dissects from below above the fold of skin limited by the three first incisions to about half its height, in order to mobilize it. He afterwards fixes with two lateral sutures the musculocutaneous layer in such a manner that the lashes are brought 2 mm. away from the free margin of the lid, and lastly excises from the inferior part of the large layer a fold of skin 2 mm. high, transplanting it on the prepared surface of the free border of the lid. This small fold which is transplanted is fixed by sutures of silk with fine needles, and finally sutures are applied in the three primary incisions. The author claims to have had good results with this method in cases where others have failed entirely.

An Apparatus for Obtaining Sphygmie Oscillations of the Ocular Tension Contemporaneously With the Pulse Curve.

BETTI, L. (*Ottalmologia*, Vol. XX), has constructed an apparatus with which he has obtained sphygmie oscillations of the ocular tension contemporaneously with the pulse curve, and concludes as follows:

First: Tension of the normal human eye in disease is subject for the most part to rhythmic oscillations, depending upon the heart action.

Second: This reaches its minimum value during the moment of cardiac systole, and reaches its greatest height during diastole.

Third: The tracings of the endocular pressure describe an undulated line with the ascending curve much more brief and quicker than those of the descent.

Fourth: We do not observe secondary rises comparable to the rises of rebound or to those of elasticity of the sphygmie curve.

Fifth: There does not exist in man oscillations of intra-ocular pressure synchronous with the respiration.

SOCIETY PROCEEDINGS.

BY

ARTHUR J. BEDELL, M. D.,

ALBANY.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

Regular meeting, March 16, 1914. President Dr. Wesley Hamilton Peck in the chair.

An Anomalous Nerve Head With Good Vision.

Dr. Michael Goldenburg exhibited the case reported at the February meeting.

Glaucoma as an Etiologic Factor in Insanity.

Dr. Carl B. Welton, Peoria, reported the case of Mrs. J. W., aged sixty-nine years, who was admitted to the Peoria State Hospital for the Insane, December 9, 1912. At the time of her commitment the insanity had been present four months. Her history showed there was no insanity in her immediate family nor in the family of either parent. She had never had any disease of the eyes, and her vision had always been good until September, 1911, when the eyes became painful, sensitive to light, and her vision began to fail. This condition grew worse until three or four months later; the pain in the eye became so severe that she had to be given opiates continually. In April, 1913, when the author first saw the patient, she had recovered her mental faculties to a degree, so that she could carry on a fairly intelligent conversation and could clearly tell the conditions and circumstances of her past life up to the time that she began the use of drugs. She complained of continual pain in the eyes, examination of which disclosed the typical picture of an absolute glaucoma. Both eyes were injected and painful to the touch. The corneae were somewhat

opaque with dulled reflex and lost sensitiveness, both eyes in a state of glaucomatous degeneration. The globes were ectatic, the pigment epithelium of the retina was visible through the thinned and bluish sclera in several places. The anterior chamber obliterated, the pupils dilated, irregular, unequal in size, and not reacting to light or accommodation. The lenses were partially opaque, and no reflex could be obtained from either fundus. The tension with the Schiötz tonometer was 70 mm. in the right eye and 75 mm. in the left.

An operation was advised to relieve the pain caused by the increased ocular pressure. On May 19, 1913, under ether anesthesia, an Elliot trephining of the sclera was performed on each eye. The sclera, which was extremely thinned, was easily pierced by the trephine, the piece removed and a small buttonhole iridectomy made. A prompt recovery followed.

On December 23, 1913, the patient was again examined, and there was no injection, pain or tenderness in either eye. The tension with the tonometer was: right eye, 13 mm.; left eye, 55 mm. Why the patient did not have pain and tenderness in the left eye, which still registered 55 mm., was, he believed, due to the highly atrophic condition of the eye from the long continued high tension. At least with this tension still remaining after the operation she had no discomfort or complaint, and the advisability of a secondary operation was not considered.

Cases of this kind simply showed the necessity of educational work by oculists among the men engaged in general practice for the purpose of promoting the earlier recognition of symptoms indicative of a grave eye disease. When a physician was called to see a patient who was having pain in the eyes or in whom the vision was rapidly failing, it became at once his duty to know by means of competent help whether or not he had to deal with a serious disease of the eye.

Discussion.—Dr. L. W. Dean, Iowa City, Iowa, said he had had four rather disagreeable experiences. The first was a patient with frontal sinus trouble who was operated, but no mental disturbance noticed at the time of operation. One morning she was found dead in her room. She had taken a scarf, tied it around her neck, fastened it to a hook on the wall, held her knees up from the floor, and hanged herself in that way.

The second case of insanity was one following operation for strabismus. The patient came to have his eyes straightened before getting married. The second day following the strabismus operation he became maniacal. He made several attempts to take his life. It was necessary to place him in a straight jacket. He was seen by Dr. Witte, who expressed the opinion that he might become insane at any time. He became insane. The worry of getting married, together with the disturbance of bandaging the eyes following a strabismus operation, an advancement with tenotomy, resulted in his becoming mentally unbalanced.

The third case was a woman who complained of terrific pain in the head and had severe spasm of accommodation. She came from a very fine family. Her surroundings were perfect. She came to Iowa City, was ill at the time, and was placed in a hospital. Dr. Dean did not notice anything wrong with the woman, nor did the sister. She went into the bathroom one day, and as one of the sisters did not hear any sounds she peeped over the transom and saw that the woman was trying to drown herself in the bathtub. She was unconscious, but was resuscitated. He was sent for and in consultation with Dr. Hill it was found that the woman was insane.

A fourth case was in the hospital at the present time. She had terrific pain in the head and was committed to the insane hospital. Before she was sent, at the request of her husband, Dr. Dean examined her and found that she had neuritic atrophy of the nerve on the side of a mastoid lesion, and before operating he made a diagnosis of extradural or brain abscess secondary to mastoid disease of long standing. At the operation he found a very large temporosphenoidal abscess. He evacuated fully an ounce and a half of pus. This relieved the pain. The operation was done six weeks ago and the woman will be sent to the asylum within a week. He received a requisition from Dr. Witte the other day stating that this woman was a typical case of melancholia; that the attack was brought about by infection of the cerebral substance, although the infection could not be considered in any sense of the word as the cause of her insanity. It was simply a contributory factor.

The Fusion Faculty as a Type of Faculty.

Dr. M. Z. Albro stated that (1) with few exceptions, the fusion faculty developed naturally if it was not interfered with. In the same way we saw the development of the co-ordinated use of the hands, or of the lower extremities, as in walking, or of the vocal apparatus in the beginning of speech.

2. In a few individuals the fusion faculty does not appear, and cannot be induced to appear by any present known means, even when no obstacle to its development existed. The result was the same as though some nervous structure essential to fusion had failed embryologically.

3. The fusion faculty may appear in early life, but its development might be interfered with by the presence of refractive errors, such as hypermetropia, myopia, anisometropia, astigmatism, by scars of the cornea, by malformations, muscular, ligamentous or bony, or by the results of traumatism or inflammation. When so interfered with this faculty became latent.

4. When the fusion faculty became latent its potentiality progressively diminished to the vanishing point.

5. Up to a certain age the latency of the fusion faculty might be overcome, its potential aroused and developed to a practical working force that would then remain permanently established through life.

6. In the secondary development of fusion, the quantitative development varied in individuals, and this variation was strongly modified by variation in individuals in the ability to fix the attention, by the intensity of effort applied, by the degree to which systematic use of time, effort and apparatus could be maintained.

7. Under normal conditions, the fusion faculty reached a working quantitative development early in life, after which it was permanent and could be disturbed only by influences amounting to violence, either general or local.

8. The amount of power, force, or ability to perform fusion normally developed varied in different individuals—from zero to sixty degrees, as measured by the amblyoscope. When the total fusion ability amounted to sixty degrees, a part of it was voluntary.

9. The fusion faculty might be voluntarily suspended. The

ophthalmologist suspended fusion when he used the ophthalmoscope or retinoscope; the microscopist when using the microscope, and the expert rifleman when sighting his rifle. This might be called a negative phase of fusion. There was such a thing as true voluntary fusion.

10. Fusion was intimately associated with accommodation and convergence.

11. Distinctly separated areas of the cell structures of the brain must cooperate in the performance of the fusion faculty; therefore, associative fibers connecting these areas must be likewise concerned. Possibly congenital lack or failure of development of certain neurons might account for its occasional omission.

12. We might infer that education did not consist in the training of the eye alone, nor of the ear or hand. Neither did it consist of the accumulation of facts or aggregations of facts, but lay in the development of control faculties, associative faculties.

Discussion.—Dr. J. F. Burkholder, in speaking on the neurology of the fusion faculty, presented a series of twenty-one lantern slides and an hypothesis as to the localization of the fusion faculty.

The faculty must of course be considered as a complicated arrangement of purposeful reflexes, made up of simple elementary components with receptors, conductors and effectors; the effectors are the muscles for the orientation of the eyeballs.

In considering the neuron tracts from the retina to the extrinsic muscles of the eye, the first locality where a series of possible physiologic associations might take place is the optic chiasma; but in view of the heterogeneous connections that the chiasma makes with irrelative parts of the encephalon, no such purposeful function as the fusion faculty could possibly take place. The constructions and associations of the chiasma were then briefly given as follows:

1. The interretinal fibers, called the commissura arcuata of Hannover.
2. The fasciculus cruciatus, or crossed bundle of the ophthalmologists.
3. The fasciculus noncruciatus, or uncrossed bundle.
4. The commissura superior of Meynert, from the nucleus lenticularis to the opposite subthalamic nucleus of Lays.

5. Hemispheric bundle of Gudden, from the tract to the hemisphere.

6. Commissura ansata, from the lamina terminalis to the opposite optic nerve.

7. The commissura hypothalamica, connecting the two sub-thalamic regions.

8. The tractus peduncularis transversus, called also the habenulopeduncular tract, connecting the interpeduncular ganglion with the habenular nucleus.

9. The commissura inferior of Gudden, connecting the two inferior quadrigeminal bodies via the chiasma.

It is self-evident from this variegated assortment of associations that a theory accounting for any coordinating activities would be hard to formulate and still more difficult to defend.

After leaving the chiasma, the next place of importance that must be carefully considered is the colliculus superior, or the anterior pair of the corpora quadrigemina. A series of illustrations showing the evolution of these bodies from the lamprey eel to the pigeon were presented. The development in complexity of the structure of these bodies as the environment of the organism increases in extent is simply for one purpose, and that is to bring the organism in correspondence with the increased environment. In so low an animal as the lamprey eel you will find an eye and a musculature for the orientation of that eye. In addition you find in the brain a large body, called the optic lobe, to which the optic nerve can easily be traced. In these lower animals there is no cerebral differentiation to receive and interpret impressions of light, so that the perceptions of light as well as the coordinating of the muscles of orientation must take place in these bodies. The histologic structure of the anterior pair clearly indicates that they have very complicated functions to perform. Winkler and Potter give the following strata as obtaining in the rabbit's colliculi superiores:

1. Stratum zonate.
2. Stratum griseum superficiale (small cells).
3. Stratum griseum superficiale (large cells).
4. Stratum medullare superficiale (optic radiation).
5. Stratum griseum intermedium.
6. Stratum medullare intermedium (lateral lemniscus).
7. Stratum griseum profundum.

8. *Stratum medullare profundum* (fountain decussation of Meynert).

9. *Stratum substantium griseum centrale*.

As soon as the geniculate bodies and the occipital cortex begin to develop, these quadrigeminal bodies rapidly become smaller and less complex, some of their functions being shifted further back to the cortex.

The same laminated arrangement of structure obtains in the occipital cortex, as is clearly shown by stained sections.

The anterior pair of the corpora quadrigemina are very important bodies, and the integrative activities of the twelve extrinsic muscles of the eyeballs are unquestionably regulated through this optical substation. The coarse adjustment of the eye muscles is regulated by this organ, as it were, while the fine adjustment is effected by the fusion centers located in the occipital cortex.

So long as the animals had only monocular single vision, as in the fishes, amphibians and birds, the coarse adjustments effected by the optic lobes (the anterior pair of the corpora quadrigemina of the higher vertebrates) was sufficient for all purposes; but as soon as the two eyes moved around to the front and binocular single vision became a necessity, a finer orientation or adjustment became imperative. These finer adjustments must of necessity lie in close proximity to the organ of visual sensations, and were, as a consequence, also shifted to the occipital lobe. The very wide and important associations of the *colliculi superiores* is evident when we consider their remarkable anatomic connections, which might be enumerated as follows:

1. With the retina, by means of the optic tracts.
2. With the occipital lobes, by way of the optic radiation.
3. With the midbrain, by means of the fountain decussation of Meynert and posterior longitudinal bundle, thence by means of collaterals to the third, fourth, and sixth nerves.
4. With the spinal cord, by the *fasciculus ventrolateralis profundis*.
5. With the lateral lemniscus, via the *colliculus inferior*, thus bringing the visual apparatus into association with the cochlear nuclei and superior olive.

Phylogenetically the anterior pair of the corpora quadrigemina come first, then the lateral geniculate body, and lastly

the occipital cortex; and as soon as the latter two structures became active, the corpora quadrigemina lost its prerogative as a visual center and retained its coarse reflex functions only. The colliculi, however, retain a remarkably intimate association with the occipital cortex by means of the optic radiation, and this association between the colliculi and the occipital cortex is of the most intimate character. In this radiation we have both the corticifugal and corticipetal fibers, so that the associative activities can be regulated with great precision. This intimate association of the perceptual and reflex mechanisms becomes a necessity when we remember the extreme exactitude in adjustment that the fusion faculty demands. There are two distinct subdivisions in the optic radiation, and one of these is distinctly myelinated at birth and forms what Flechsig calls the optic radiation in the narrower sense; this tract Monakow claims brings the macula in direct association with the cells in the walls of the calcarine fissure, via the external geniculate body.

In the occipital cortex you have the same laminated arrangement of its constituent elements as is found in the retina and the colliculi, as already noted. The occipital cortex, however, has more layers than any of the other cortical areas, showing that there is more complexity as to function; this is further emphasized by a distinct separation of the occipital cortex into two clearly defined subdivisions by the line of Gennari or *Vic d'Azyr*. It is our impression that these separate subdivisions of the occipital cortex have distinct and separate functions to perform, and we would suggest that one of these has to do with the visual faculty and the other with the fusion faculty. This becomes all the more apparent when we consider the intimate association made possible between the cortex of the two occipital lobes by means of the posterior fibers of the corpus callosum forming what anatomists call the splenium, making the hypothesis that there is a fusion center or faculty in each occipital lobe, associated by means of the corpus callosum, a working hypothesis based upon demonstrable anatomic conditions.

Diploic Abscess.

Dr. George F. Suker said that about a year ago he presented the same patient, whom he operated for what he called a diploic abscess due to diploic hemorrhages. The young man

fell out of a swing several years ago, striking on the right temporo-frontal region. His head was bruised considerably. Several years after this, patient noticed a protuberance over the ridge of the right orbit. At the external canthal end of the upper lid a fluctuating mass was protruding. This was a sac which was taken to be a dermoid cyst, as he had several dermoids removed before in other parts of the body. Under local anesthesia he made an incision, got down to the cyst, and found it was adherent to the periosteum. He cut into the cyst, began to curette, went as far as he could, but as some of the material he extracted had the appearance of brain tissue, he discontinued. He took a specimen of the tissue to the laboratory, and it was pronounced suspicious of brain substance. He thought the patient might develop meningitis, but did not. The wound kept on discharging, but there was nothing found except unorganized tissue and some saprophytic bacteria. Subsequently, under general anesthesia, he made an incision from the orbital ridge upward and backward, and found the frontal bone very thin; upon breaking through, a mass was discovered which resembled an onion, in that it was made up in layers. This mass rested on the upper orbital contents and extended almost to the lesser wing of the sphenoid; the petrous portion of the temporal bone was exposed. The frontal lobe was compressed upwards. The mass was pear-shaped. There was an edematous right and left disc with a right proptosis, but no diplopia. Vision was 20/30 in left eye, and 20/30 in the right. As the wound kept on discharging he injected Beck's paste, and subsequently had to go after the paste with a second operation, as it caused much swelling and edema. He curetted again and obtained nothing of the mass. Patient now has a small sinus tract running toward the median line, and if one uses a large sized probe he can produce hemorrhage, owing to the granulation tissue present. The patient never had any diplopia. The dura was exposed. The roof of the orbit was gone and this space had no connection with the frontal sinus, because at the first operation he exposed the frontal sinus, and found no connection whatsoever (several X-ray plates were shown). At the same time he curetted and removed as much of the ethmoidal and sphenoidal processes as possible with a clean sweep and drained through the nose.

He did not know the nature of the tissue removed, though it was submitted to many pathologists. If any member could suggest a method of treatment for this sinus without opening it up again, or could suggest the nature of this mass, he would be greatly obliged.

Choked Disc—Decompression Operation With Tapping of the Ventricle.

Dr. Suker showed a little girl who first came under his observation a little over a year ago. Her vision at that time was 20/30, with a low degree of hypermetropia, not more than 1 D. She complained of persistent headache, with vacillating diplopia, due to paresis of right external rectus, which would come on for a day or two and then disappear. Knowing from the history that her vision was 20/20 minus in right eye and 20/30 in left eye two years ago (Dr. Barr), after examining her carefully he found she had a bilateral choked disc of about 3 mm. swelling. He had her under observation for about three months before it was decided to operate, as the vision began to decrease and the disc became more choked. Both neurologic and gynecologic examinations were negative. With the progression of the choked disc she had a decrease of vision in each eye so that an operation became necessary. In conjunction with Dr. Kanavel, a decompression was performed on the right temporal area. As soon as the trocar entered the ventricle, clear spinal fluid escaped. Subsequent to the operation patient had a complete hemiplegia of the spastic type, which lasted for some time and then disappeared. The headache disappeared as soon as the patient came out from the anesthetic. Vision had improved somewhat. The field of vision was characteristic (exhibited fields). One set was taken a year ago and the other set was taken on the 13th of March of this year—a red and form field in the right eye, and a green and form field in the left. The X-ray plates showed a characteristic condition. As a result of decompression the patient had a cerebral hernia which is very soft and seems to fluctuate. As the brain tissue was so close to the skin, Dr. Kanavel did not dare to tap or explore, particularly as the patient feels so well. One X-ray plate showed enlargement of the sella turcica. Patient was now free from pain; she has no headache, and it did not hurt her to move

around or press upon the hernia. The only symptom she complained of was incessant headache and occasional paresis of the right external rectus, and on account of the involvement of the right external rectus it was decided to make a decompression on the right side and tap the ventricles. Within three days the bilateral choked disc of about 5 mm. completely disappeared. There is now a secondary atrophy, which is stationary.

Discussion.—Dr. Emory Hill asked whether the girl had polyuria, to which Dr. Suker replied, no.

Dr. H. B. Young, Burlington, Iowa, stated that several years ago he exhibited a girl with the same general characteristics as those noted in the case presented by Dr. Suker, and a report of the autopsy he gave a little over a year ago. There was internal hydrocephalus, with so much pressure on the internal table of the skull that the grooves for the different convolutions were 20 per cent deeper than normal of the average skull. She recovered under tuberculin injections, remained well for four years, and developed so rapidly that she weighed 150 pounds when she was only fifteen years of age. She died suddenly at six o'clock one morning. The autopsy disclosed what he had just mentioned.

PAUL GUILFORD,
Secretary.

COLORADO OPHTHALMOLOGICAL SOCIETY.

Meeting of March 21, 1914. Dr. H. Aufmwasser presiding.

Vossius Lens Ring.

Dr. G. L. Strader presented a boiler maker whose left eye had on March 3rd been penetrated by a piece of steel one-third inch long. The wound began at the temporal limbus and passed through the sclera. The piece of steel had been easily withdrawn through the wound of entrance by means of the magnet, and there had been no reaction. The eye was not seen again for about a week, but at this time the condition was noted for which the patient was presented. In a position corresponding to that of an average sized pupil there appeared at the surface of the lens a distinct ring, which seemed to be made up of very fine dots, there being finer dots in the center of the ring, and also one quite large one. The ring had begun to disappear four or five days before the meeting, and was now rather hard to see. Dr. Strader referred to Vossius' original report of six cases, and to two cases reported by Gifford in 1909, and discussed the various theories of causation. The ring was only visible through the ophthalmoscope.

Discussion.—Dr. Jackson referred to the recent work of Prêlat, in which rabbits' eyes were experimentally injured by arrows tipped with India rubber. Microscopic examination agreed with Gifford's observation that the superficial layers of the lens were injured. Dr. Jackson thought that the reason why the opacity could not be seen by oblique illumination was that the opacity was due to disturbance of refraction in the anterior layers of the lens.

Orbital Injury by Glass.

Dr. Otis Orendorff gave an account of an injury which had occurred to himself. Two weeks previously in cranking his automobile his spectacle lens was broken and fragments driven probably about an inch into the soft tissues at the upper part of the left orbit. There had been a rather sharp cellulitis.

Several particles of glass had been removed at the time of the injury, but it was probable that there were a number of small fragments deeply imbedded, and that these were responsible for persistent irritation and discharge. For a time there had been paralysis of sensation over the area supplied by the supraorbital nerve, but the area of numbness had been reduced to about half its original size after removal of one of the pieces of glass.

Discussion.—Dr. Black referred to a case in which particles of wood had continued to appear at the surface for several months after the original injury.

Dr. Patterson referred to a case in which a piece of glass had remained imbedded in the forehead for a long period without signs of irritation.

Dr. Coover spoke of the case of a baby who had been injured by a nursing bottle, six or seven pieces of which had been removed. Quite recently, eighteen months after the injury, a good sized piece of glass had become palpable just beneath the skin.

Orbital Injury by Splinters of Wood.

Dr. Edward Jackson reported the case of a man whose left orbit had been penetrated by a piece of wooden molding, which passed through the upper lid. The patient first came on account of diplopia, and was found to have left hypophoria of four or five centrad in the primary position, increasing to nine or ten centrad on looking down. At the left external canthus there was a ragged scar, apparently involving the lower half of the external tendon. The patient returned almost a year later. The diplopia had almost disappeared until two weeks previously, since when there had been a swelling at the outer canthus which proved to contain pus. No necrosed bone could be found with a probe, but for a year or more the patient came in from time to time on account of reopening of the small sinus, with evacuation on two occasions of splinters of wood. The patient had been advised that there was possibly some wood still left against the wall of the orbit; but that complete exploration would require an extensive operation under general anesthesia.

Headache From Large Middle Turbinates.

Dr. W. C. Bane reported the case of a young woman, careful correction of whose refractive error had failed to relieve persistent frontal headache, which had disappeared entirely after removal of a portion of each middle turbinate. The headache had apparently been due to pressure of the turbinates against the septum. The usual characteristic of headache from this cause was that it was worse in the morning and got better during the day.

Rapid Reduction in Astigmatism.

Dr. Edward Jackson reported the case of a man who at the age of nineteen had required R. — 2.25 sph. \ominus + 3.00 cyl. ax. 100° , and L. — 3.25 sph. \ominus + 2.75 cyl. ax. 80° ; but who, on returning twenty-eight months later, had taken R. — 2.25 sph. \ominus + 0.25 cyl. ax. 110° , and L. — 3. sph. \ominus + 0.50 cyl. ax. 50° . At the first examination the ophthalmometer reading was R. 41.5 \ominus + 3. cyl. ax. 100° , L. 41.75 \ominus + 2.5 cyl. ax. 85° ; and at the later one R. 42. \ominus + 2. cyl. ax. 95° , L. 42.25 \ominus + 2. cyl. ax. 85° . Thus both cornea and lens had had a part in the unusually rapid reduction of total astigmatism.

Blindness From Disease of Optic Chiasm.

Dr. Edward Jackson reported the case of a man of twenty-six years who in November last became rapidly blind in both eyes. There had been several partial recoveries of vision and several relapses. On December 8th the vision of each eye was shadows. Wassermann test and nasal and X-ray examinations were all negative so far as offering any explanation of the eye condition was concerned. Loss of sight had begun with a haze in the middle of the field. The patient was six feet six inches in height, but belonged to a tall family. The discs were clear, possibly rather white. Under sodium salicylate there was distinct gain in vision, which was poorest in the center of the fields. When after eight days vision had improved in each eye to 1/150, it was found that the temporal fields were blind. The blood pressure was 148 mm. On January 31st R. V. was 1/20 m., L. 1/15 m. The later treatment had included thyroid extract, with continuation of the salicylate. There seemed to be no question that the lesion

was in the chiasmi. Towards the end of the treatment the steady improvement had pointed to a neuritis in the chiasm, more akin to a retrobulbar neuritis than to any other condition, at first so severe as to cause complete blindness, and later clearing so as to show distinct scotoma.

Discussion.—Dr. Neepor had had three cases of transient complete blindness, one lasting several days with relapses. One cleared up after an intrasphenoidal operation, another after a rapid burst of secretion from the nose, mixed with blood.

Squint of Amblyopic Eye Cured by Correction of Good Eye.

Dr. W. H. Crisp reported the case of a boy, aged nine years, who had been brought with a request for operation on account of convergent squint. The right eye had turned in since the age of one year, and several refractive corrections had been worn, beginning at two and a half years. Vision was: R. 1/40 m., with poor fixation, L. 4/5 pt. The following lenses were being worn: R. $+2.50$ sph. $\square +0.50$ cyl. ax. 90° , L. $+0.25$ sph. $\square +0.50$ cyl. ax. 90° . There was convergence of twenty-three centrads. The vision of the right eye was not improved by any lens. Under cycloplegia full correction of R. $+3.75$ sph. $\square -1.50$ cyl. ax. 5° , L. $+3.25$ sph. $\square -1.50$ cyl. ax. 5° , was given. The squint was now only apparent when the boy was fatigued. The case was of interest in that the convergence of the right eye seemed largely to depend upon accommodative strain in the left and seeing eye; probably as the result of the coordination of excessive innervation to the internal recti with undue accommodative effort.

Apoplectic Quadrant Anopsia.

Dr. W. H. Crisp reported the case of a woman of forty-two years, of robust health and negative history, who had come on account of the sudden appearance of a cloud over the upper nasal corner of the right visual field. The disturbance had come on with severe headache and a sense of dizziness. The right field in the quadrant complained of was contracted about half way to the center. The eyes were in every respect otherwise normal, the fundus presenting no arteriosclerosis. There was low compound hyperopic astigmatism, which had not pre-

viously been corrected. Four months later the condition of the eyes and the outline of the field were the same, and the patient had had no further trouble.

Standardization of Test Types.

Dr. Edward Jackson demonstrated two small cards of test type, upon which an attempt had been made to standardize the visual acuity in uniformity with the international broken ring test, especially in relation to the fact that the apparent visual acuity varies for different letters of the same size.

Meeting of April 18, 1914. Dr. W. C. Bane presiding.

Subconjunctival Injection for Corneal Ulcer.

Dr. D. H. Coover presented a physician who twenty-five years previously had lost one eye from infection, which in the other eye had left a dense corneal leucoma. Ten years ago the opacity had somewhat cleared under the use of thiosinamin, and the eye had been fairly useful until about six years back, when the patient came with a severe inflammation involving the whole cornea. Upon improvement an optical iridectomy had been done below. Two weeks ago the cornea began to break down near the center, and rapid spread of the ulcer seemed to threaten entire loss of the eye. A subconjunctival injection was made, containing fifteen minims of 1:1500 solution of cyanid of mercury with one-third grain novocain. There as a terrific reaction during which edema extended over the forehead and cheek, and the conjunctiva stuck out beyond the lids. After three days the conjunctiva was still so edematous that linear incisions were made, after which the swelling partly went down. The ulcer immediately began to fill in, and in six days was completely covered.

Discussion.—Dr. Black had had a case of punctured wound involving cornea, iris and lens, in which the anterior chamber was filled with yellow organized pus. A week after two injections of cyanid of mercury the mass in the anterior chamber had entirely disappeared. But the eye later became worse again and had to be enucleated.

Dr. Patterson had used a 1:5000 solution with one per cent acoin, which produced less reaction and very little pain.

Congenital Absence of External Rectus.

Dr. W. H. Crisp presented two patients in each of whom there appeared to be a congenital absence of one external rectus muscle. The first patient was a woman of twenty-three years, who had come for correction of squint. The history indicated that since birth the right eye had been incapable of outward rotation, although always regarded as the better eye. This eye had 0.75 D. of hyperopic astigmatism, and the left eye 4.50 D. With correction each eye had vision 5/7.5. The right eye could not be brought out beyond the median line, although movements were otherwise normal. There was distinct flattening of this eye at the normal site of insertion of the external rectus. The second patient was a boy of eleven years, whose left eye had turned in since birth, although it fixed perfectly and had normal vision. The limitation of movement of this eye corresponded precisely to that of the right eye in the first patient, but there was no flattening of the globe. Neither patient had ever been troubled with diplopia. In the boy some cosmetic improvement had been got from tenotomy of the left internus, and the possibility of transplantation of a part of the superior and inferior recti to the normal position of insertion of the externus had been suggested as regards both patients.

Discussion.—Dr. Black had found that on putting a red glass over the good eye of either patient, as soon as a moving light was carried beyond the point where the poor eye could fix on it, so that the rays of light no longer fell on the macula, the light was seen as red, although it had previously only been seen as white. With the red glass over the defective eye the light was seen as white in every direction.

Dr. Patterson had a similar case in a girl of seventeen or eighteen years, the left eye being affected. But this patient had diplopia.

Dr. Coover had shown a case some years ago in which after incision through the conjunctiva no trace of inferior rectus could be found.

Dr. Jackson had seen about half a dozen cases of congenital paralysis of the externus. He believed several eyes had been anatomically examined by other authors, and that in no case had a muscle been found. There had been no complaint of diplopia in any case he had seen, nor was he able to develop diplopia in either of three personal cases.

Congenital Inequality of Pupils and Palpebral Fissures, With Heterochromia.

Dr. W. H. Crisp presented a boy of sixteen years, who had been referred for refraction on account of a generally distributed muscular tic. The left pupil was distinctly smaller than the right, the size in bright light being R. 2.5, L. 2 mm. The left palpebral aperture was ordinarily 5 mm. in diameter, as against right 6 mm. The right iris had some admixture of brown pigment on a blue ground, the left iris being perfectly blue. The boy was of retarded mental development, and was attending a school for defective children. There was decided inequality of refraction of the two eyes, the right being nearly emmetropic, the left having 2 D. of mixed astigmatism. The left pupil was very slightly encroached upon by the upper lid.

Atypical Retinitis Circinata.

Dr. Edward Jackson reported further concerning the case of tumor-like swelling at the macula, in a man of fifty-nine years, of which a colored drawing had been shown at the October meeting. The vision of the affected eye, which had been reduced to 1/15 pt., was now 5/6 pt. with correction. The macular area, which had been prominent 3 D. in the swollen region, was now level. There were large yellowish dots, partly confluent, forming somewhat of a wreath at the margin and massed in the upper part of the affected area. The fovea was rather gray. Towards the nasal edge of the area was a pigment blotch one-third d. d. across. The case was probably more of the nature of an atypical retinitis circinata than anything else. The patient had been on vigorous iodid treatment.

Ocular Pain From Abscess at Root of Tooth.

Dr. W. H. Crisp reported the case of a woman of thirty years, who in spite of refractive correction had complained of persistent pain over the left eye. At the same time she was suffering from a painful condition in the left side of her neck and left arm, which her physician had diagnosed as neuritis. The pain over the eye disappeared almost immediately after opening of a tiny abscess at the root of a crowned left upper molar tooth. The only symptom apparently connected with the tooth had been a slight occasional dull aching

over the antrum, to which the patient had given almost no attention. The pain in the neck and arm disappeared in about twenty-four hours. On two occasions within a few weeks after the abscess was opened the dentist began to fill the cavity which he had drilled in the tooth. In each instance headache came on after several hours, and was at once relieved by removal of the preliminary filling.

Discussion.—Dr. Patterson had seen a young physician who had had double antrum empyema, and later began to have pain back of the mastoid and over the temple, which kept him awake at night. He was cutting wisdom teeth. Cocainizing of the wisdom tooth by the dentist stopped the pain at once. X-ray examination showed the tooth to be hooked forward in the root of the next molar. Permanent relief from pain was obtained after removal of the wisdom tooth.

Traumatic Internal Ophthalmoplegia.

Dr. Melville Black reported the case of a young man who had been struck on the head by a heavy scantling. The visual acuity of each eye was normal, but the right pupil was widely dilated, and there was absolutely no accommodation in this eye. The left pupil was slightly ectopic upward. It seemed possible that the paralysis was due to a small cerebral hemorrhage caused by the accident.

Albuminuric Retinitis.

Dr. A. C. Magruder reported the case of a young woman, primipara, whose urine had been regularly examined without finding any albumin until three days before delivery, when a large amount of albumin was present. Caesarean section was done. A week after operation the vision of the right eye was fingers at one meter, and of the left somewhat better. The amount of albumin present was then seven per mille. Both discs were swollen, but there were no hemorrhages. Under eliminative treatment the amount of albumin had fluctuated between seven or eight and three or four per mille; and the vision got worse or better in proportion to the quantity of albumin present.

WILLIAM H. CRISP,
Secretary.

OPHTHALMIC SECTION
ST. LOUIS MEDICAL SOCIETY.

Meeting of January 7, 1914.

Spot in the Right Eye Which Had Been Present Since Birth.

Dr. F. C. Woodruff: A girl, four years old, was presented at the clinic of the St. Louis Eye, Ear, Nose and Throat Infirmary, December 3, 1913, for a spot in the right eye, which the mother said had been present since birth with no apparent variation from its present appearance. The case was seen in connection with Dr. H. S. Hughes, who has kindly written the following report:

The child seems of normal physical development, but very backward mentally; has had none of the usual diseases of childhood except measles one year ago, but for the first two years of her life was very frail. She is a second child, was born at full term, with a simple delivery, no instruments, following an uneventful pregnancy. The second day after birth the right eye became very much inflamed, lids closed and very much swollen, with some discharge at their margins. The family physician ordered silver nitrate solution and warm compresses. After about ten days the symptoms subsided, and when the eye could be opened the mother noticed a white reflex in the pupillary area, much as you see it now. The eye has been quiet since.

The right eye shows slight internal strabismus, shallow anterior chamber with small anterior synechia at seven o'clock, with some minute pigmented specks upon the anterior capsule of the lens. Vision equals perception of light and probably large moving objects. Refraction about plus 1.50 in all meridians.

Looking into the pupil a white reflex is noticed at the temporal side, shading off from a dense yellowish white at the periphery to a thinner steel gray in the middle of the vitreous chamber, about the color of a pearl button. The base of this is close up against the ciliary body at the other margin of the lens and extends backward and upward, and conforms to the convexity of the posterior surface of the lens.

Extending from it to the posterior surface of the iris are a few dense shreds. A larger one extends out across the vitreous. The left eye seems normal.

Discussion.—Dr. Jennings: The case presented by Dr. Woodruff is of great interest. In my opinion it is one of those rare cases of retarded development. The string-like membrane in the vitreous is the canal of Cloquet, and the white opaque patch at the back of the lens is the membrane that should have disappeared at birth, and when covering the whole posterior surface of the lens is called a pseudoglioma.

Presentation of Cases Operated on by Col. Elliot, November 4, 1913.

Dr. Clarence Loeb: The first case, Mrs. L. F., showed a beautiful result as far as the operation was concerned. There was good filtration, but the eye was no softer and the vision was practically no better than the other eye, which had been treated with eserine and pilocarpin. The second case, Mr. W. R., had had an acute conjunctivitis following the operation, but this subsided promptly under treatment without infecting the interior of the eye. There was good filtration and the tension was normal. The pupil was elongated, owing to the fact that a portion of the sphincter had been excised at the time of the operation. The vision had been increased from nearly 6/15 to nearly 6/8 with the proper correcting glasses. The other eye, treated with eserine and pilocarpin, had retained its vision of 6/6 nearly. The third patient, Mrs. S., had run a very unfavorable course. Immediately after the operation there was a low grade iritis, which persisted in spite of treatment. After about two weeks' treatment, patient stated that ever since the operation she had seen halos around lights in both eyes. The treatment was changed to eserine and pilocarpin and the halos promptly disappeared, while the other symptoms in the operated eye gradually improved. At the present time the eye is still somewhat red, no halos seen, vision 1/12 (before operation nearly 6/15). The other eye had a vision of 6/15 nearly, as opposed to 6/8 before the operation.

From these three cases I do not see any particular benefit that the operation offered over the use of miotics. I recall another case where, after an ordinary iridectomy in an eye where vision and visual fields were diminishing, there was a

sudden fall of vision (excentric to 6/30) and almost total loss of the visual field. The other eye, however, had retained a vision of 6/6 and good visual fields under eserin and pilocarpin. I believe that the operative measure proposed by Col. Elliot is a good one where the patients cannot be kept under observation, but I would always use miotics when I could see the patient regularly and operate at once if any untoward symptoms arose. I believe that further advance in the treatment must be not along operative lines, but along lines leading to a determination of the cause of the disease and its elimination and prevention.

Discussion.—Dr. Gross: How about the tension in these three cases?

Dr. Loeb, in closing: The tension in all of these cases was not measured, but in all three was slightly increased before the operation. Since the operation, in my opinion, it is about the same; slightly lower, perhaps, but no better than in the unoperated eye, in which I have used eserin and pilocarpin.

**A Piece of Steel Localized Partly In and Partly Out of the Eyeball
Near the Optic Nerve, Removed by Forceps
Through the Orbit.**

Dr. J. Ellis Jennings: W. W., age twenty-four years, was struck in the left eye by a piece of steel, November 14, 1913, and came to the Frisco Hospital. The foreign body entered the eye in the ciliary region to the temporal side. With the ophthalmoscope the metal could be seen far back in the vitreous. The wound of entrance was enlarged and an effort made to draw it out with the giant magnet. Much to our surprise, efforts to dislodge it failed. An X-ray plate was then made and the foreign body localized in the sclera near the optic nerve, partly in and partly out of the eye. After thinking over the matter it was decided to attempt its removal by way of the orbit. Under general anesthesia the external rectus muscle was divided and secured by means of a suture. The eyeball was then rotated inwards as far as possible, and hugging the eyeball on the temporal side the orbital tissues were pushed aside until with a probe the optic nerve could be felt. Although adrenalin had been injected into the tissues, there was considerable bleeding, which rendered the search difficult. In the end, however, a black point was seen protruding from the sclera, and Dr. Woolsey quickly grasped

it with forceps and drew it out. Since the operation the vision of that eye has improved to 5/20.

Discussion.—Dr. Woodruff: I would like to ask if Dr. Jennings tried the piece of steel with the magnet afterwards to see whether it was really attracted by the magnet, whether it was magnetic or not.

Dr. Loeb: How is the movement of the eye since the re-attachment of the muscle?

Dr. Jennings, in closing: The movement had been perfect. In answer to Dr. Woodruff's question, I did not try the magnet after the removal of the foreign body, but as it was a chip of steel from a rail, I suppose it would be attracted as any other piece of steel. The reason the magnet did not pull the steel out was that it was deeply imbedded in the sclera.

Meeting of February 4, 1914.

Foreign Body in the Retina.

Dr. C. W. Tooker for Dr. Higbee: The patient, a man thirty years of age, came to the office for treatment three weeks ago, two months after a piece of metal from a hammer had struck him in the eye. He presented himself for lid treatment only. On dilatation of the pupil it was seen that he had in the anterior temporal quadrant a torn retina with a small piece of iron imbedded in the sclera. X-ray localization confirmed the ophthalmoscopic findings. Extraction was accomplished by the small electric magnet with incision in the sclera under cocain anesthesia. Vision is now 14/15. The interesting points are the ophthalmic picture and the lack of history of intraocular trouble.

Retrobulbar Neuritis With Ethmoidal Involvement—Report of a Case.

Dr. W. Hardy: After an extensive discussion of the anatomic relations of the orbit, the nose and its sinuses, he spoke of the frequency of sinus complications, giving the following figures:

Birch-Hirschfeld found in 684 cases of orbital inflammations, the sinuses involved in 60 per cent, divided as follows: The frontal sinus 29.8 per cent, the antrum 21.8 per cent, the ethmoid 20.5 per cent and the sphenoid 6.1 per cent.

Cohen and Remking reported 25 cases of nasal sinus disease with orbital complications. These occurred in 75,000 patients, or 1 to 3,000.

He argued against firm pressure of the skin over the orbital rim, or pressure on the supraorbital nerve as misleading, but spoke of pain at the root of the nose accompanying intranasal disease, frontal sinusitis and also exophoria and ametropia. Pain is not a prominent feature in cases such as the one described in the paper. In bilateral trouble he suspects the sphenoid, and in unilateral the ethmoids. According to Holden, the etiologic factor in a nontoxic retrobulbar neuritis is generally a multiple sclerosis or sinus disease. He referred to peripheral scotomata and optic neuritis demanding an examination of the nose. Even where no nasal symptoms seem present, and even later at operation where the nose apparently shows nothing, he agrees with some other writers. If any section of the optic nerve is involved by inflammation of the vicinity, operation is indicated, and the sooner it is done the better.

F. K., aged twenty-seven years, blonde, single, and painter by trade. Consulted me in November, 1912, stating that ten days previously, while walking along the street, he noticed he could not see well with his left eye. Vision diminished until at the time of his first visit it was reduced to fingers at thirty inches. O. D. V. 15/10. His history was good, being a man of excellent habits. He denied all venereal infection. He was careful about his hands and nails, thoroughly cleansing both before handling food. His work brought him little in contact with methyl alcohol. Five days after the onset of eye trouble, and five days before his first visit, he took a cold, as he expressed it. No particular attention was paid to it. He had had many previous colds. The discharge was mucopurulent and from both nostrils. Examination showed sluggish iris movements, media clear and fundus normal except that there was a slight tortuosity of the retinal veins and a slight haziness of the edges of the disc, becoming significant by comparison with the right fundus. Throughout the entire course of the disease the fundus picture changed but little except that the disc became paler than its fellow and two small hemorrhages appeared, one near the upper border of the disc and the other several disc diameters up and out from the

papilla. He returned to his family physician, who daily essayed to shrink the mucous membrane of the nose, with little or no effect on either the ocular or nasal condition. After a week's persuasion he finally consented to an examination by a rhinologist, and after more persuasion to an operation. The middle turbinate was removed, the ethmoid cells broken down and the sphenoid sinus opened up freely. The nasal work was done by Dr. Herman B. Miller. Improvement commenced very soon after the operation and proceeded rapidly. The nasal discharge quickly subsided, vision improved until when last seen it was 15/10. The disc was still paler than its fellow. He considered plumbism, methyl alcohol poisoning, autointoxication, lues and ethmoid trouble. He was convinced that the ethmoid infection was latent, the result of prior infection, and that it reinfects the nasal mucous membrane, producing an acute mucopurulent rhinitis. The nasal condition as seen by Dr. Miller, and the prompt improvement both ocular and nasal following the operation, bear out this contention and lessen the probability of its being a mere coincidence. There was no local treatment subsequent to the operation. Dionin was used before the operation. Internally medium doses of sodium iodid and strychnin were given and continued until the patient was discharged.

Discussion.—Dr. Post spoke of his interest in the cause of such cases, and felt that the oculist should examine such patients and make his diagnosis, questioned the feasibility of the oculist opening the sphenoid and ethmoid, and also advised against jumping at conclusions.

Dr. Charles wished to emphasize the patient's complaint of deep seated pain in the eye and not simply the pain in the orbit.

Dr. Hardy, in closing: The diagnosis by exclusion was not made as a matter of choice, but was done while the patient was deliberating about consulting a rhinologist. A tentative diagnosis of sinus involvement was really made at the first visit.

WILLIS HOSPITAL, OPHTHALMIC SOCIETY.

Meeting of February 3, 1914. Dr. William Zentmayer, chairman.

Case of Glaucoma Operated on by the Elliot Method.

Dr. P. N. K. Schwenk said that the case he desired to show was the most successful case of Elliot operation that had come under his observation, done by himself, out of seven cases. One case he wanted to report was operated on by Col. Elliot himself, and last week it was found necessary to remove the eye on which the Elliot operation had been done. Dr. Schwenk could not relieve her of pain, and the eye went from bad to worse, and to save her from further suffering he advised enucleation. She had an aortic murmur and a blood pressure of 200 mm. Hg. This was the first time he had been called upon to remove an eye after the Elliot operation. In his estimation the Elliot operation should only be done on chronic glaucomatous eyes; not on any eye where there was a tendency to inflammation.

Hyperphoria Following Frontal Sinus Operation.

Dr. Schwenk showed a case which had been operated on for frontal sinusitis on February 7, 1911. After the operation the patient had a right hyperphoria of eight degrees with vision 6/15; with correction today the right eye equals 6/6 and the left eye equals 6/6. With the hyperphoria corrected the upper lid movement was somewhat limited.

Foreign Body Perforating the Globe.

Dr. Schwenk showed a case of foreign body passing through the ball. There was a gunshot wound in the right eye. The shot passed through the ball and was localized just about 10 mm. outside of the optic nerve. Vision today was 6/6.

Contracted Socket.

Dr. Zentmayer showed a case which was operated on by the Maxwell method two weeks ago tomorrow. The patient had this eye enucleated ten years ago and was wearing an

artificial eye until one year ago; then the socket contracted and forced the eye out, and she was no longer able to wear it, and without the artificial eye it became irritated. The Maxwell operation was performed, and it was very interesting to compare it with Dr. Ziegler's result. The shell was in, but it was not fair to judge the result with this shell, because the socket was deep and forced the artificial eye upwards and backwards, as there was no sulcus above. Dr. Zentmayer pointed out the depth of the sulcus. This was such an unusual operation that Dr. Zentmayer showed the procedure on the blackboard. An incision of 5 mm. was first made inside the orbit behind the margin of the lid; then the incision was deepened and carried behind the lower lid so as to get the required depth to the cul-de-sac. An incision was then made outside the lid, on the cheek, about 5 mm. from the border of the lid. These two were connected with another incision, which included a space of skin of about 12 mm. The third step was to free this flap except for the central area, which is left attached. The next step was to connect the upper incision with the orbital incision, pass sutures through each horn of the crescentic piece of skin, slip them through the tunnel and bring them out into the orbit and attach to the angles of the orbital incision. The piece of skin on the cheek becomes the floor of the cul-de-sac. While it was only two weeks since the operation, the external incision could scarcely be seen. Dr. Zentmayer thought this operation superior to any nonpedicle flap operation. He had operated on two cases by the Weeks method. One shrunk in three months and the patient could no longer wear an artificial eye. Dr. Zentmayer thought if the flap was attached at its middle the danger of shrinkage was very little indeed. If the upper lid was involved, then it became a more serious operation, because the levator had to be cut. Aside from this it was just as simple as on the lower lid, and performed the same way.

Case of Congenital Glaucoma.

Dr. Zentmayer showed a most unusual case of congenital glaucoma with marked distention of the globe. The patient had been fortunate enough to retain vision up to this age; he was now forty-seven; which was certainly very unusual. The left eye was lost by the same process, and the right had been

rapidly going the past year. He had a tension of over 100 mm. and was maintained at 90 mm., notwithstanding rest in bed and careful use of pilocarpin and subconjunctival injections of sodium citrate. The sodium citrate seemed to lower the tension temporarily. It got as low as 60 mm., but this was right after the injections, and it always returned to 90 mm. or more. With this he had congestive attacks, and found difficulty in getting about. Central vision was 20/40 with his correction, which was aphakial, the lens having been dislocated into the vitreous and became absorbed. He was kept in the hospital for two months, but as at the end of this time he was not willing to accept the advice of operation, he went home and his vision continued to fail. He came down three weeks ago and an Elliot operation was performed. It was especially difficult to take hold of the iris with the iris forceps, as it would slip back into the vitreous on each attempt. The pupillary margin of the iris was finally seized with a blunt hook and dragged out and snipped off by the assistant. The tension was then 12 mm., and he had had no congestive attack since the operation.

Xerosis of the Cornea and Conjunctiva.

Dr. Picard showed a colored woman, thirty-six years old, and one of eight children. She was the only one afflicted with xerosis. It began eight years ago with dryness of conjunctivæ and dryness of the lids. This was followed by loss of cilia, and followed later by complete alopecia of the head, and later of loss of hair over various parts of the body.

At the present time there was entire loss of tears with blocking up of the canaliculi, the cornea was insensitive, and there was complete loss of vision. Both corneæ were covered with an epithelial growth. There was loss of the cul-de-sac, while both lids could be closed.

This condition appearing in children is known as keratomalacia, and is fatal, free pus developing in the cornea and death resulting from complications—pneumonia and septicæmia.

Nothing has been proven of the germ theory in this condition, and taking into consideration the various affections of the skin in the different parts of the body, Dr. Picard was inclined to view this as a manifestation of a central lesion.

Orbital Abscess From Maxillary Sinus Disease.

Dr. Posey showed a case of orbital abscess from disease of the superior maxillary, in a child five years old, from his service at the Children's Hospital. He referred to a previous report of two cases of this condition by him before the Ophthalmic Section of the American Medical Association in 1912. According to Dr. Posey, the disease of the bone frequently arises from the alveolar border, but at other times the antral cavity is at fault. Proptosis is usually marked, and unless free drainage is established the eye may be lost from panophthalmitis. He spoke at length upon the development of the antrum and referred to Onodi's illustrations to demonstrate the points which he raised.

Congenital Cataracts With Dislocation of the Lens.

Dr. Posey showed a second case from his service at the Children's Hospital of zonular cataracts in each eye, conjoined with an upward and inward dislocation of the left lens. He had recently needled the right lens, with resultant absorption of lens matter.

Discussion.—Dr. Zentmayer, discussing Dr. Posey's case, said that such cases either start with a purulent inflammation of the maxillary sinus or a periostitis of the maxillary bone. In recent work it has been shown that the sinuses develop much earlier than was formerly supposed, so that we may consider an inflammation of the sinuses as an etiologic factor in these early cases. While he had never had a case of this kind, he had frequently seen the sequel in an ectropion from an adherent scar at the lower orbital margin.

Cataract From Electric Shock.

Dr. Posey showed a case of cataract in each eye in a man thirty-three years of age, following an electric shock. Loss of sight ensued about three months after the injury, which was occasioned by the patient's head coming in contact with a live wire. The strength of the current was said to be 4,400 volts. In addition to the ocular lesions, the injury had entailed severe burns of the right frontal region, of the right shoulder and left arm. The loss of vision, which had appeared first in the right eye and in the left eye some months later,

had progressed so far that on admission vision in right eye equaled light perception only, in left eye 4/60. Examination revealed extreme scarring about the right eye, with some ectropion of the upper lid, but no damage to the ocular structure beyond the lenticular changes. These consisted of an irregular central anterior opacity about 1x2 mm. in size, of a grayish color, and of a general diffuse haze of the entire anterior portion of the lens, made up apparently of numerous minute opaque globules. Combined extraction of the right lens and subsequent needling was accomplished with resultant corrected vision of 5/20, illiterate. No ophthalmoscopic changes were evident in either fundus. Dr. Posey referred to a recent paper of Lauder of Cleveland, who had reported a similar case and referred to several other cases in literature.

Exophthalmus.

Dr. Fisher reported the following case: Eight or nine days ago this boy, aged eleven years, came to the hospital showing marked proptosis, left eye interfering with action of the muscles, both of the lids and eyeball. A hard mass filled the orbit and protruded, a lobulated border extending one-fourth to one-half inch over the lower margin of the orbit. History of six weeks' development without pain, and previous diagnosis of possible cancer was obtained. The nerve head was hyperemic, and there was pronounced reduction in the size of the arteries. Vision, 6/15. That of the right eye, 6/6. Consent of the father was obtained for the removal of the eye if found necessary. One week ago he was prepared for operation, but finding the proptosis much less, ocular motion restored and recession of the mass to within the orbit proper, interference was deferred. By advice of Drs. Posey and Zentmayer the boy was put to bed under the alternating application of ice compresses and pressure bandage, and has progressed to the present satisfactory condition. The mass, however, can still be found on inner half of the floor of the orbit. The case is presented as being possibly due to sinus trouble. X-ray was made and it was thought that there was distinct shadow. Another plate will be made for comparison.

Discussion.—In his discussion of Dr. Fisher's case, Dr. Posey said that when he had first seen the case he had been led to make a diagnosis of orbital cellulitis from antral

disease, even though no positive signs of inflammation of that cavity were present at the time. In his experience, fully nine-tenths of all cases of cellulitis are secondary to sinus affections; the orbit being a closed cavity, inflammation frequently persists after the drainage from the sinuses had permitted all inflammatory signs to disappear from these cavities. On account of the danger of optic neuritis and possible atrophy from inflammation, arising from continuity of tissue, he had counseled incision to relieve the proptosis occasioned by the cellulitis. He had never before seen such a rapid subsidence of an orbital cellulitis without operative treatment.

J. MILTON GRISCOM,

Secretary.

BOOK REVIEWS.

Disturbances of the Visual Functions.

By PROF. W. LOHMANN, Chief Physician to the University Eye Clinic, Munich. Translated by ANGUS MACNAB, M. B., F. R. C. S. Eng., Ophthalmic Surgeon to King Edward VII. Hospital, Windsor. Published by P. Blakiston's Son & Co., Philadelphia, 1914. Price, \$3.50.

The original of this work was reviewed in the ANNALS, page 830 1912. The present book is an excellent translation, which will be of great service to those who have not read the German text. C. L.

Ophthalmic Surgery.

By CHARLES H. BEARD, Chicago. Second Edition. Published by P. Blakiston's Son & Co., Philadelphia, 1914. Price, \$5.00.

The second edition of this well known work is a revision and condensation of the first, with the introduction of several new chapters. Of these, the most important are those on the Newer Operations for Glaucoma and on the Surgical Treatment of Detachment of the Retina. The former deals especially with simple chronic glaucoma. The author gives a modification of the Elliot method of forming the flap, which is much easier of performance and probably as efficacious in preventing infection and aiding drainage. Reviewing the different operations, the author states that he favors anterior sclerotomy. A special description is given of Deutschmann's operation for detachment of the retina. The author believes that surgical methods should be used, even if the oculist is pessimistic in regard to their value. C. L.

Guide to the Microscopic Examination of the Eye.

By PROFESSOR R. GREEFF, Director of the University Ophthalmic Clinique in the Royal Charity Hospital, Berlin, with the cooperation of PROFESSOR STOCK, Freiburg, and PROFESSOR WINTERSTEINER, Vienna. Translated from the third

German edition, by HUGH WALKER, M. A., M. B., C. M.,
Ophthalmic Surgeon to the Victoria Infirmary, Glasgow.
Published by Paul B. Hoeber, 69 East 59th St., New York.
Price, \$2.00.

There are now several works dealing with the technic of the microscopic examination of the eye, but the value of this one is second to none. The authors have done so much along this line that the methods recommended by them can be accepted without question. The volume consists of 86 pages, with six illustrations, divided into two parts. The first describes the various methods of preparation and staining of the eye as a whole. The second, special part takes up the various tissues and describes the technic of preparing them for examination. The Appendix describes the methods of examining the secretions and bacteria of the eye. There are numerous references to other investigators. C. L.

Anaphylaxia in Ophthalmology.

By PROF. A. VON SZILY. Assisted by DR. U. ARISAWA, with
Preface by PROF. T. AXENFELD. F. Enke, Stuttgart, 1914.

The author has undertaken a gigantic task in trying to cover the whole field of anaphylaxia in ophthalmology and has committed himself creditably in completing a work which is a pioneer in this branch, and most comprehensive in extent. In it he exhibits a wide and exhaustive knowledge of his subject. It is most welcome to all of us who are interested in this, our newest branch of medicine.

The first chapter deals with an introduction into the basic principles of anaphylaxia in general, which in itself can be read with appreciation by most of us. The technic is taken up in a separate chapter, including Abderhalden's methods, both dialysis and optic.

There is also a separate chapter dealing with the toxic properties of the various tissues of the eye, with especial reference to toxicity of extracts from the lens and uveal tract.

Chapter IX devotes seventy-one pages to the important and much discussed consideration of sympathetic ophthalmia, as anaphylactic uveitis, with some original control experiments by Arisawa. The relationship between anaphylaxia and clinical phenomena is taken up in chapter XI, especially tuber-

culosis serum anaphylaxia, conjunctiva in relation to anaphylaxia, and experiments in the relation of anaphylaxia and cataract.

Throughout, the actual facts are separated from the purely theoretical.

M. W.

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XXII.

A CASE OF CHRONIC SPOROTRICHOSIS OF THE EYE.*

ARTHUR J. BEDELL, M. D., F. A. C. S.,

ALBANY.

On December 18, 1913, Mr. C. S. A., aged forty-nine years, a hotel manager, consulted me because of a constant discharge from his right eye, which had lasted two years and which persisted, despite various treatment given by several physicians. In 1910 the eye began to annoy him, but it was not until July, 1911, while in a New York City hospital for an appendectomy, that the condition became so severe as to demand treatment. All sorts of solutions have been used in his eye since that time.

On examination the skin of the right eyelids was congested. There was an irregular conjunctival mass 7 mm. x 5 mm. x 2 mm. to the nasal side of the upper right lid, extending 2 mm. beyond the ciliary margin. This was much like ordinary granulation tissue in appearance, structure and relation to the conjunctiva. The entire palpebral conjunctiva, especially the inner half of both upper and lower lids, was congested, with many discrete follicles and numerous 1 mm. ulcerating points. These ulcers were

*Read before the American Ophthalmological Society, May, 1914.

shallow, yellowish gray areas. The inner half of the bulbar conjunctiva was congested with several enlarged follicles. The caruncular fold was three times its normal thickness and uniformly infiltrated. Both puncta were prominent and dilated, and the inner canthus flooded with yellow, somewhat tenacious mucus. After thorough irrigation the discharge would quickly reform. Pressure on the lacrimal sac caused no regurgitation, nor was there any fullness over it. The corneal epithelium was lost over an irregular 4 mm. area to the nasal side of the apex. Pupil 3 mm., active to light and accommodation; disc clearly outlined; no fundus lesion; vision equal 20/70.

The left eye vision equal 20/70. Conjunctiva and fundus negative.

Cultures were taken by Dr. James F. Rooney, but while waiting for a report treatment was started, as the case was considered to be in all probability sporotrichosis. This was positively proven later. Wassermann reaction negative.

On January 26th, after having been on saturated solution of potassium iodid, one gram three times a day, he was sent to the Albany Hospital. The granulation from upper lid and the caruncular fold were both removed and sent to the Bender Laboratory, from which Dr. Harry S. Bernstein reports:

"Specimen consists of two fragments of soft tissue, the largest of which measures 2 mm. x 1.5 mm. Microscopic examination shows the presence of a stratified squamous epithelium with a dense subjacent infiltration of cells. The epithelium of the larger fragment is edematous. A moderate number of polymorphonuclear leucocytes are found amongst the epithelial cells. Plasma cells, small and large lymphocytes in close apposition, with a few intersecting bundles of connective tissue cells, form the dense sub-epithelial infiltration. An occasional plasma cell contains two nuclei. A rare prelymphocyte is seen."

Diagnosis: Subacute and chronic inflammation. Lymphoma cannot be excluded.

On February 1st the inferior and superior right ducts were opened and five firm brown concretions were removed from the ducts and sac, after which the sac was thoroughly curetted. These concretions ranged in size from 1.5 mm.

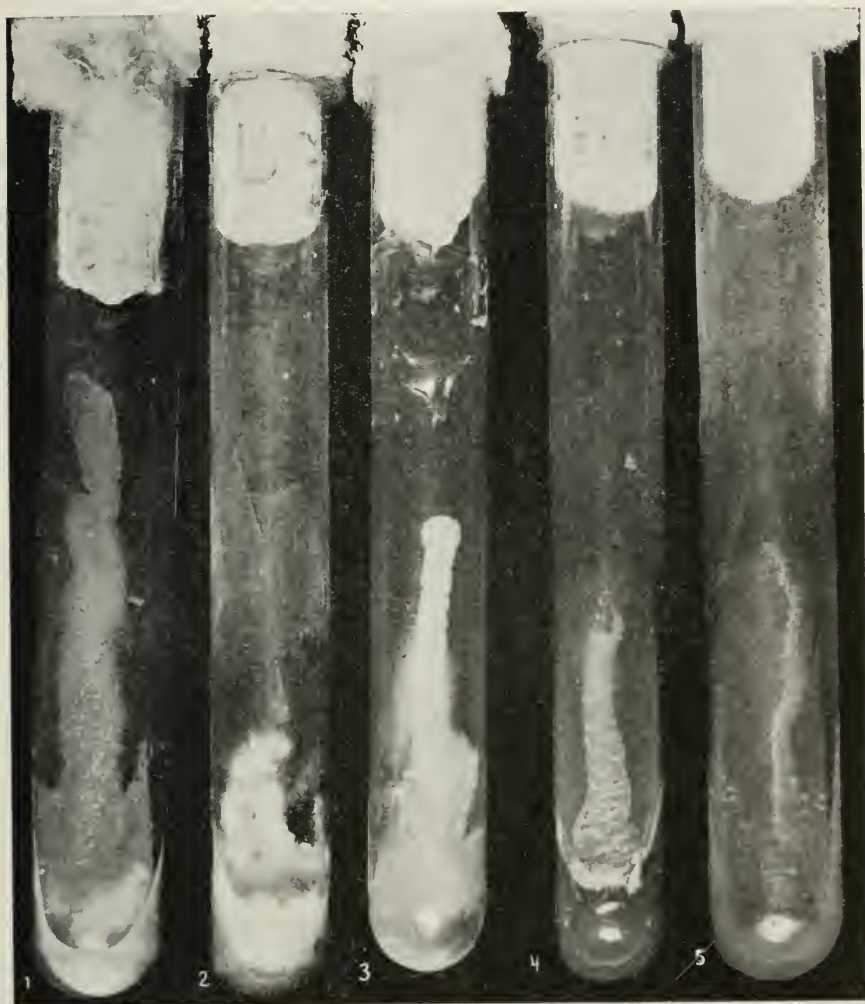


FIGURE 1.

- 1.—Four weeks old, blastomycetic type, Saboureaud's.
- 2.—Six weeks old, blastomycetic type, lactose litmus agar.
- 3.—Three weeks old, type B, Saboureaud's.
- 4.—Three weeks old, type B, Saboureaud's.
- 5.—Ten weeks old, type A, Saboureaud's.

in diameter to an oval 2 x 6 mm. The sporotrichum was found in culture after crushing these. The entire conjunctival surface was painted daily with tincture of iodine, and saturated solution potassium iodide given in two gram doses three times a day.

Recovery was uneventful. The small ulcers healed quickly, no new ones presented, and the lids were entirely smooth by February 10th, since which time there has been no secretion and practically no lachrymation.

The length of time the condition had lasted, the severity of infection and the complete recovery, are points of interest in this case, for with the correcting lenses the patient has 20/15 vision and easily reads Jaeger 1. At no time was the left eye involved, although the right discharged so freely that the pus literally ran down the cheek. It is not possible to state the definite time of infection. Although the patient was in a hospital when the eye became decidedly worse, no attention was paid to the ocular condition, and it is therefore impossible to tell whether he had constitutional symptoms, for as far as known he had no marked glandular involvement at that time. Many smears were made from his conjunctival discharge, but seemingly no cultures taken.

In a careful study of reports from the United States, ocular involvement has been noted twice: Gifford's case of definite conjunctival symptoms, diagnosed by finding the sporotrichum in the conjunctival secretion, and Wilder's, of infection while working with sporotrichial cultures.

Reudiger, in his analysis, finds that most of the United States cases have been confined to the Western States, especially the Missouri valley. My patient has proven that he has not been west for many years, practically spending all of his time between New York City in the winter and the St. Lawrence River in the summer.

The appended bibliography will show that any and every part of an eye has been affected in human patients as well as in laboratory experiments; suffice it, therefore, to call your attention to the titles of the recorded articles.

The commonest sites of infection are the lower and upper lids, the cornea and the iris. Conjunctival discharge varies. In only two other cases was the secretion profuse, although

several histories make no mention of the amount, and still more fail to describe the character of even the little noted.

My object in reporting this case is two fold: first, it is the third ocular infection reported in the United States, and second, because of its clinical suggestion of tubercular, luetic or Parinaud's conjunctivitis with the possibility of mistaking it for trachoma.

It may be easily differentiated by finding the typical organism and by a negative tuberculin or Wassermann

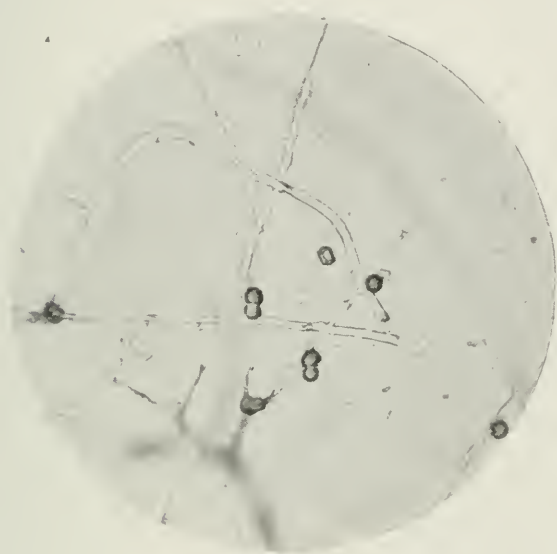


FIGURE 2.

Levulose bouillon. Filament and spores, eight weeks. B. and L. Oc. 1x900, unstained.

reaction. Culture will be of great assistance in the acute form of sporotrichial infection, for the clinical resemblance to Parinaud's conjunctivitis is marked.

It is very probable that other cases have been seen and classed as lues because they were cured by the use of iodids.

Bacteriologic report by Drs. James F. Rooney and Lawrence R. Worrell.

The first cultures were taken December 18, 1913, on

nutrient agar and bloom serum, and showed no growth after five days.

Second cultures, incubated at 37° C., showed visible growth after five days, in the form of minute transparent colonies, separate, slightly raised, circular in outline, circumference smooth (not rayed), and having an almost uniform diameter of approximately 0.4 mm. Growth progressed very slowly and the cultures were removed from the thermostat at the end of the eighth day, and subsequent growth was at room temperature. At an average temperature of 20° C. growth was more rapid than at 37° C., although slow at best. There was little tendency to confluence until the colonies had attained a diameter of approximately 2 mm., and then the edges of the separate colonies simply merged, those on the edge of the streak retaining their individuality. In the primary cultures, growth practically became stationary after the streak reached a diameter of four millimeters.

Secondary growths were made on the sugar agars, plain agar, sugar litmus agars, gelatin, plain broth and sugar broths in fermentation tubes, potato and litmus milk.

Secondary growths resembled in all particulars the character of the primary culture, except for increased rapidity, the first colonies being apparent at the end of from forty-eight to fifty-six hours. Growth was more luxuriant upon the sugar agars, and of these especially on the maltose agar. Growth was more rapid at room temperature than in the thermostat, as in the original cultures, although an incubation for twenty-four hours and subsequent growth at room temperature gave best results.

Growth on Saboureaud's medium was no more luxuriant than on the sugar agars, and no different in character.

In plain bouillon growth was scanty, flocculate and slightly granular, mainly at bottom of tube, no pellicle, no general clouding.

In sugar broths growth was more profuse than in plain broth, and of the same character, but with tendency to form longer strings. No fermentation of any of the sugars used, viz.: saccharose, dextrose, levulose, maltose, lactose. No fermentation of inulin or starch. No fermentation of glycerin. Sugar litmus agars showed acidity in some tubes,

but not in all. On potato the growth was transparent, forming a crinkled veil over the surface of the medium with a crinkled pellicle upon the water in the bottom of the tube.

Milk was neither acidified nor coagulated, and growth was very scanty.



FIGURE 3.

B. and L. 2/3x250. Masses mycelium and spores.
Levulose bouillon, unstained.

Gelatin not liquefied. Organism is a strict aerobe.

A subculture, taken from a six-weeks-old bouillon culture, gave upon agar, Saboureaud's medium and the sugar agars a surprising difference in appearance. Growth was luxuriant, very rapid, moist and glistening, at first smooth,

with elevated margin which was itself smooth and of regular symmetrical outline. The color was at first a pale, whitish yellow; about the fifth day a tendency toward a green brown began, and then the whole streak darkened, assuming, after the fifteenth to twentieth day, a distinct dark brown color. At an early stage of the darkening of the colony the medium commenced to be stained and gradually assumed a very dark brown appearance, somewhat lighter, however, than the colony itself. This change in the medium began in the upper part of the tube synchronously with the deepening of the color of the colony, and gradually progressed downward, finally leaving all the medium a deep coffee color. After ten or twelve transplants the smooth or slightly papulate appearance of the growth was lost and it began to assume a wrinkled appearance with irregularly arranged circinate ridges and furrows, dry, dull and opaque. Gelatin was slowly liquefied. This change occurred upon the second transplant from agar to Saboureaud's medium.

At present the character of the two subvarieties upon Saboureaud's medium is entirely dissimilar. The first shows a scanty growth made up of minute transparent colonies, coalescent slowly and with a circinate margin. The color is grayish white with a porcelain-like appearance in older growths, and the margin becomes minutely fimbriate. There is little growth in the water of condensation. The other shows a luxuriantly rapid growth, yellowish in color, smooth and glistening, yeast-like in consistency, and with a smooth linear margin. The color rapidly darkens, especially on exposure to the light, and becomes brown with staining of the medium of growth. The water of condensation becomes filled with a pasty yeast-like mass.

Microscopically the unstained smear shows abundant double contoured long and short threads, granular, septate branching. The diameter of these threads varies from 0.5 micron to 2.5 micra, the diameter, however, being constant in the same culture. Spores are both round and spiculate, and in the early cultures there were innumerable highly refractile homogeneous fusiform bodies of double contour, lying free about the mycelium, but unattached to it, approximately 1.0 by 2.5 micra. The septa are of varying length

and are more apparent and frequent the older the culture. Chlamydospores are uncommon, but occur, and are both terminal and integral. When chlamydospores are found,

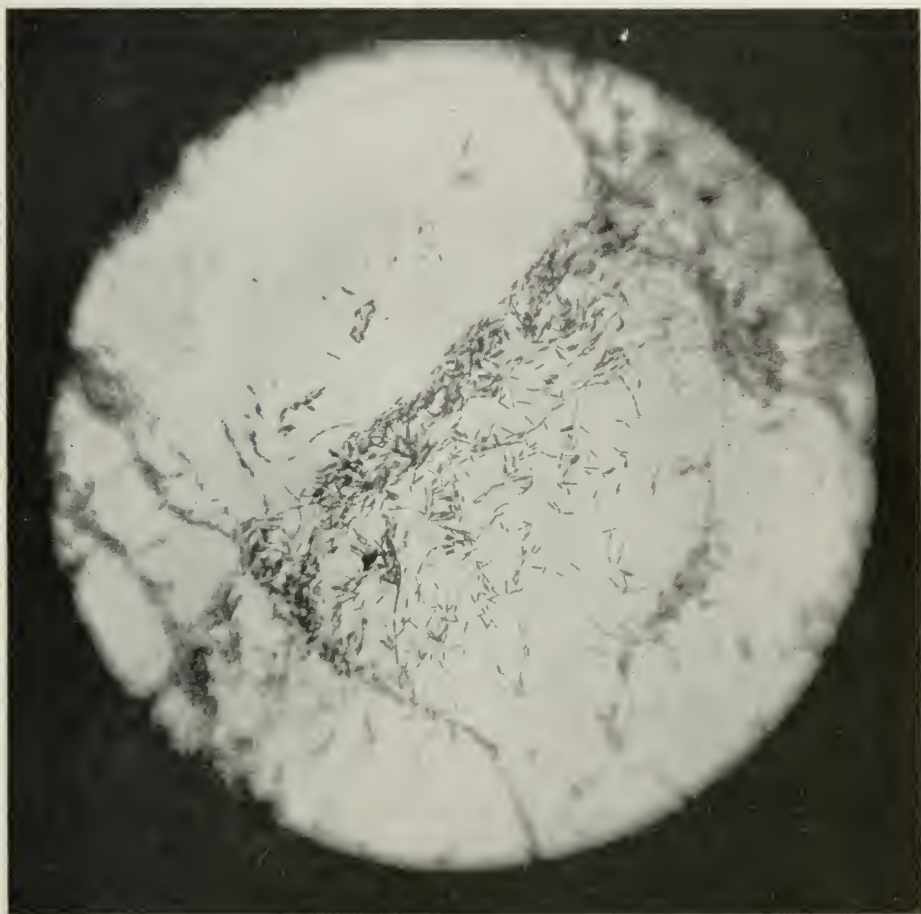


FIGURE 4.

Ten days' culture, Saboureaud's, Gram stain. Mycelium, long and short segments, moderate branching chlamydo- and arthrospores. Difference staining mycelium. Gram negative with G. positive granules. B. L. 1/12x600.

they are usually in pairs and occupy adjacent sides of a septum. The Eco spores are most commonly lateral, although some subcultures show a chain of spores at the

terminus of a filament. They are attached by short and thin sterigmata to the mycelium.

The mycelium generally is Gram negative, although the granules, which are usually massed at the poles of the separate elements of the mycelium, retain the violet of the stain, as do many of the finer granules in the mycelium. The spores are also Gram positive. The young, incompletely septate mycelium is uniformly and homogeneously Gram positive. The limiting membrane of the mycelium does

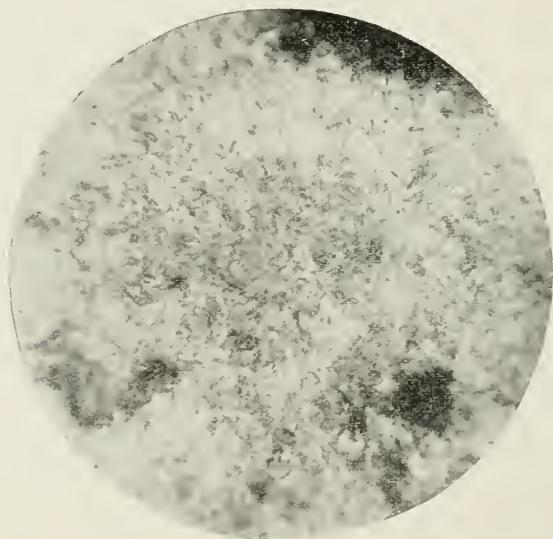


FIGURE 5.

Short mycelium and fusiform bodies, third transplant from stain. B. L. 1/12x600, type A.

not appear to stain. The septa seem to have a minute operculum, by means of which there is continuity of protoplasm throughout the filament. The fusiform bodies described above do not take either the violet or the pyronin of the counter stain, and remain unstained by all the common dyes.

The organism is not acid fast, decolorizing readily by either alcohol or acids, after carbol fuchsin. It stains rather poorly by Loeffler's solution. The protoplasm with

Wright's stain is basophile, the polar mass tending to take the azure of the stain, although rather weakly.

CONCLUSION.

The organism is composed of a branching spore bearing mycelium which is septate and granular, together with fusiform bodies of uncertain origin, resembling the bodies described by De Beurmann as occurring within the tissues of artificially infected animals and in the pus from human infection. The spores are most commonly isolated and attached to the mycelium by a short and thin sterigma.

It is Gram negative and nonacid fast. Morphologically it conforms with Link's definition of the botanic group sporotrichum. Culturally it shows marked differences from any of the previously described varieties and their pleomorphisms, although seeming closer to the Schenck type as concerns color and sparseness of growth, and to the De Beurmann type as concerns cultural and morphologic pleomorphism. The organism is still being studied as to its pathogenicity for animals as well as its further cultural characteristics.

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XXIII.

ACQUIRED SYMMETRICAL OPACITIES OF THE CORNEA OF UNUSUAL TYPE.*

GEORGE F. LIBBY, M. D.,

DENVER.

The case herewith reported is so rare that no member of the Colorado Ophthalmological Society could recall seeing another like it, and search of ophthalmic literature has failed to find a description of the condition. While it suggests the family or hereditary type of degeneration of the cornea, most diligent inquiry has not disclosed a case of corneal involvement or even noticeably defective vision in three generations. The patient's mother died at forty-six, of Bright's disease. Her father, an old soldier who had "suffered from rheumatism" since 1865, was still living, aged seventy. There was no ascertainable tuberculosis on the paternal or maternal side.

On May 23, 1911, Dr. D. S. Schenck, of La Jara, Colorado, referred the patient, a woman of thirty-seven, who stated that about four years earlier her attention was first called to her eyes by daily darting pains, which had been relieved only in the past six months. A white spot appeared in the inner half of the right cornea three years after the ocular pain began, and a similar spot in the corresponding area of the left cornea was noticed six months later. The patient said that each opacity began as a crescent, concentric with the lower nasal margin of the cornea. Later she noticed the round opacity now seen in both eyes, and thought it had developed very suddenly. No history of corneal traumatism or inflammation could be elicited. Lenses of $+0.37$ cyl. axis 90° were being worn without appreciable improvement of vision, but in the hope of relieving occasional frontal and deep orbital aching. The patient reported uninterrupted good health except "a

*This case was presented before the Colorado Ophthalmological Society, October 21, 1911, and October 18, 1913.

little stomach trouble and female weakness," and seemed energetic and cheerful.

On examination a symmetrical opacity was seen to the nasal side of the center of each cornea, more below than above the horizontal meridian, and encroaching upon the pupillary space. The right opaque area measured 4 mm. horizontally by 4.5 mm. vertically; the left, 4.5 mm. by 5 mm. The opacities were whitish, with a faint yellowish tinge, and a few fine blood vessels penetrated each opacity. The corneal epithelium was smooth, clear and not elevated. The substantia propria was deeply invaded. Viewed through the corneal microscope the right opacity had the appearance of a mass of closely packed cholesterin crystals, as is sometimes seen in old leukomata, which was observed in only the nasal fourth of the left opacity. A slight translucency in the central half of the opaque area in the left cornea was probably due to noncrystallization of the infiltrate in that location, the degenerative process being less advanced in that eye. The temporal fourth of this opacity was more opaque than the central zone, but it showed no crystals. Trachoma and pannus were excluded.

V. R. E., 5/12 +, with -0.50 sph. $\odot + 1.50$ cyl. ax. $85^\circ = 5/6$. V. L. E., 5/12 —, with -1.00 sph. $\odot + 1.75$ cyl. ax. $125^\circ = 5/5$. These glasses were worn with comfort. The accommodation was 6 D. in the right eye and 4.50 D. in the left, with correcting lenses.

Calomel, grain 1/10, t. i. d., caused soreness of the gums and had to be discontinued. Potassium iodid was tolerated up to 15 grains t. i. d., but not larger doses. This was administered for nearly three months, and various hygienic measures practiced. An ointment of yellow oxid of mercury, 1 per cent, was massaged into the corneas, following hot applications to the eyelids every second night for two months. This was alternated with 2 per cent dionin solution for an equal length of time. Later, 2/5 per cent pilocarpin solution was instilled each morning and noon. These local and general therapeutic measures were of no appreciable benefit. The pilocarpin caused poorer vision and considerable distress.

When the patient next came for examination, October 21, 1911, a faint and very small opacity was observed slightly above and to the nasal side of the opaque area in the left eye. It had a fan-shaped leash of very fine vessels running into it.

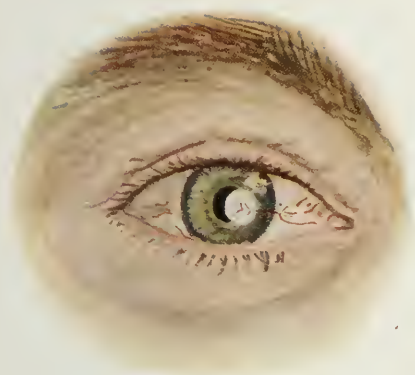
The opaque area in each eye seemed somewhat more vascularized, and the left one thinner at the center. The accompanying water color drawing, for which I am much indebted to Dr. W. C. Bane, of Denver, was then made. It portrayed the condition accurately and graphically at that time. The Wassermann reaction and von Pirquet test were both negative. As Dr. T. B. Holloway¹ had recently reported a vascular, superficial, grayish white infiltrate covering the lower quadrant of one cornea and completely hiding the underlying iris, which was associated with acne rosacea in a woman of twenty-nine, the somewhat roughened and slightly nodular skin of the patient's face was critically examined by Dr. A. J. Markley, who excluded acne.

In July, 1912, the opacities presented no change in appearance, but careful measurements showed slight increase in size in each eye. The right opacity was 4.5 by 5 mm., the left was 5 by 6 mm., and included the opaque spot noted at the previous examination.

In August, 1913, the opaque areas were 4.5 by 5.5 mm. in the right eye, the left being 6 by 6 mm., while in October of that year the right measured 5 by 6 mm., the left 6 by 6.5 mm. At this time the right opacity showed a faint spreading, deep in the substantia propria. The refraction, measured each time with and without cycloplegia, was now changed to R. E., — 0.50 sph. \ominus + 1.50 cyl. ax. 120°; L. E., + 1.25 cyl. ax. 105°. The vision with this correction was 5/9 — in the right eye, 5/6 — in the left and 5/5 — with both eyes used together. As the sunlight annoyed her, possibly because of reflection from the pupillary margins of the opacities, the lenses were ground in the Euphos glass of lightest tint.

The patient now stated that twelve years before she had a miscarriage, and that a baby born in December, 1912, had died just six months later from "lack of vitality from the day of its birth." These occurrences suggest syphilis in the mother, affecting her issue disastrously.

In consultation, Dr. Edward Jackson expressed the opinion that the opaque tissue arose from the deepest portion of the cornea and extended through, but not between, the corneal layers. The distribution of the fibrils of opacity resembled the petals of a chrysanthemum, when the flower is seen from



Acquired symmetrical opacities of the cornea of unusual type.

above. He advised against operative interference, but suggested that an optical iridectomy might be done later.

Dr. Wendell Reber² describes "A Case of Hyaline Degeneration of the Cornea," illustrated by a fine colored plate. While the appearance somewhat resembles the opacities above described, it was monocular and appeared on the day following slight injury from a flying particle while riding in a train. It was described as a milky white spot occupying the upper quadrant of the cornea. When first seen by Reber, nearly four months after its appearance, it was 5 by 7 mm. in size, of an old ivory hue, was smoothly covered by epithelium, and reached to the lower third of the pupillary area. $V. = 5/15$. Three fine vessels passed into it at the upper limbus of the cornea, the middle portion of the opacity seemed faintly lobulated, and the lower edge was shown to be distinctly crenated when examined with the binocular magnifier. After sixteen months the infiltrate had extended to the lower border of the pupil, was circular in shape, and much more vascular at the upper margin. When examined two years later, the only change noted was a thin 1.5 mm. zone in advance of the yellow area, below. Tubercular causation was suspected but not proved. Local and constitutional treatment proved unavailing.

Dr. J. Rubert,³ of Kieff, describes three cases of "Hyaline Degeneration of the Cornea," and refers to one reported by Berlin in 1887 and one by Gallenga in 1894, with microscopic findings. The common characteristics of these five cases are that each began at or near the upper corneal margin, gradually and without irritation involved about half the cornea except in one case in which nearly all the cornea was invaded, showed slight nodular elevation of the epithelium, and was associated with trachoma or pannus. One case occurred in a male, four in females, and their ages were from ten to twenty-two years. Three right eyes were affected, and one left eye, in four cases. In the fifth case both eyes were involved. Rubert dissected up the superficial layer of the cornea from the infiltrate below in one case, excised the altered tissue, and replaced the flap. Healing by primary union occurred; and vision rose from 0.1 to 0.2. In all the other cases no treatment was found that benefited the condition. Microscopically the notable changes were thickened corneal epithelium, absence of Bowman's membrane, degeneration of all normal cor-

neal elements, and thickened vessel walls with loss of endothelium. Rubert believed that these degenerated vessel walls were the starting point of the hyaline degeneration of the cornea in his cases. The colored plate (Tafel I) in Rubert's article shows that the dense opaque tissue entirely obscured the upper corneal margin, which is faintly discernible in Reber's case. In the author's patient the right eye showed a strip of clear cornea 2.5 mm. in width at the nasal limbus, where the opacity approached most nearly to the border of the cornea, while the left presented 1 mm. of clear cornea.

Dr. J. M. Ball¹ states that he "observed one case of symmetrically placed tumors of the corneæ which histologic examination showed to be fibromata." No further description and no picture of the condition is given.

From Dr. G. A. Berry's book⁵ the following is a full quotation:

"Fibroma of the Cornea.—This is an exceedingly rare affection. It occurs as a flat growth of densely white appearance, involving the superficial portion of the cornea, over the whole of which it very slowly spreads. When met with before it has involved the whole cornea it should be removed by slicing off layer after layer until the transparent tissue below it is reached."

Dr. Berry's colored illustration bears some resemblance to the sketch presented by the essayist, but the opaque area appears to be thicker and whiter and passes over the corneal margin into the sclera.

After carefully reviewing all of these cases the writer is of the opinion that his case is essentially different. It may be allied to the group known as family degeneration of the cornea, of which, however, it would present a new type; or it may be a specific lesion, although the evidence of syphilis is inconclusive. Although the sensibility of the cornea was normal, the binocular darting pains which preceded the appearance of the opacities might suggest a nerve element in the causation.

DISCUSSION.

DR. G. E. DE SCHWEINITZ, Philadelphia: I have not observed a condition exactly similar to the one Dr. Libby describes. I have a patient, a man of fifty-six years, whose

business at one time required him to be much exposed to the heat of open furnaces. He developed, when about thirty-six years of age (twenty years ago), a symmetrical crescentic patch on each cornea, in the upper part. Each lesion is glistening, yellowish white and without vascularization. They give the patient no inconvenience and are hidden, for the most part, by the ordinary position of the lids. He has normal vision, and is a normal man in every other way. A somewhat similar lesion, but in one eye only, I have observed in a Hebrew woman. All examinations, for tuberculosis, syphilis, etc., were negative. In neither of the patients to whom I have referred is there any family history of corneal affection. I assume that lesions of this character, and perhaps those described by Dr. Libby, should be classed among the corneal dystrophies.

DR. C. F. CLARK, Columbus, Ohio: It is possible that the case I am about to describe does not belong in the class of cases under consideration. It was a case of dystrophy of the cornea that I reported a number of years ago, which produced thirty diopters of astigmatism. There was a groove-like break near the upper border of the cornea. The man was a locomotive engineer, and this condition greatly impaired his vision. From thirty diopters the astigmatism was reduced to five diopters by the application of the galvanocautery to the whole length of the groove. He had the same condition, but to a less degree, in the other eye. It developed without any cause that he could discover.

DR. GEO. F. LIBBY, Denver: With regard to this case I have debated in my own mind between some type of hereditary corneal degeneration (which, of course, cannot be proved) and the possibility of a syphilitic lesion. There are so many manifestations of the latter that I think we are pretty apt to fall back on that when we are unable, as I am in this case, to explain the causation and classification of obscure conditions.

There are three other points of special interest that I would like to emphasize. The corneal epithelium is unaffected. On the other hand, all the changes are in the substance proper of the cornea; beginning at the inner layer, and penetrating at right angles to or towards the outer layer of the substantia propria. The third point is the tissue changes that have oc-

curred in the opacities. Cholesterin formation has, apparently, proceeded through the entire opacity in the right eye, partially in that of the left eye; and cholesterin crystals indicate a degenerative process.

The condition of the eyes at the present time is just about as pictured in the drawing, except that each opacity is a millimeter or a millimeter and a half larger in vertical or horizontal diameter than when the drawing was made. The sight is almost as good as at first. There is no elevation of the epithelium and it never has been rough, and I do not think there is dystrophy of the epithelium.

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XXIV.

BLEPHAROCHALASIS—REPORT OF TWO CASES.*

EDWARD STIEREN, M. D.,

PITTSBURGH.

In the Section on Ophthalmology of the American Medical Association, at the session of 1913, W. B. Weidler of New York presented a comprehensive paper on blepharochalasis, reporting therein two cases observed by himself, with the microscopic findings.

Although this condition was recognized as an ophthalmologic entity as early as 1854, having been described by MacKenzie in his celebrated work on Diseases of the Eye, the credit of applying to it the descriptive term of blepharochalasis belongs to Fuch's, who in 1896 reported a series of cases in the *Wiener klinische Wochenschrift* under this title.

As Weidler observes, many terms have been used to define this peculiar condition, but blepharochalasis is undoubtedly the most descriptive one, giving at once an idea of edema, stretching, thinning and atony of the skin and subcutaneous tissues of the lid.

In the two cases occurring under my observation, one, far advanced, has come to operation with histologic study of the excised tissues. The second case may be regarded as being in a state of suspension. At any rate, it has not advanced perceptibly within the past year, there having not yet appeared under the lax integument the collections of adipose tissue which typified my first case.

Case 1.—Miss R. W., domestic, aged nineteen years, German. Had had the usual diseases of childhood. Began to menstruate at twelve years of age. Is not certain, but believes swelling of lids began about the same time.

Condition October 14, 1911.—Much redundant tissue of

*Read at the fiftieth annual meeting of the American Ophthalmological Society, Hot Springs, Virginia, May 12-13, 1914.

upper lids, especially left, which droops almost to ciliary margin. Corneæ and media clear. Pupils responsive. Tension normal in each eye. R. V., 2/50; L. V., 6/6 —.

Refraction under homatropin: O. D., — 1.50 D. S. \ominus — 1.50 D. cyl. 180° = V. 6/10 —. O. S., + 0.75 D. S. = V. 6/5.

Right fundus.—Moderate physiologic cupping of disc, atrophic on the temporal side.

Left fundus.—Moderate physiologic cup.

The true nature of the palpebral affection was not recognized at this time, although it was proposed to excise the redundant tissue, to which patient would not consent. A full correction was ordered, and the patient was lost sight of for two years.



FIGURE 1.

Case 1 before operation.

October 9, 1913, patient reappeared, mainly on account of the troublesome condition of the upper lids, especially the left, which, according to her statement, would cover the eye completely and interfere with vision when stooping over, particularly on wash-days when bending over the tubs. The photograph (Fig. 1) was taken at this time. Upon examination the redundancy of the upper lids was found to be markedly increased, the left hanging down so far as to cover the lashes in the center and outer third of the lid. The integument was rough, scaly and so lax that it could readily be stretched over the lower lid. The skin

did not pit on pressure, but the tissues had a boggy feel when pinched between the fingers. Subcutaneous masses, not present two years earlier, could readily be felt and could be reduced backward into the orbit, only to prolapse again when pressure was removed. When so reduced the skin had the characteristic wrinkled tissue paper appearance described by Fuchs. The color of both upper lids was a dim purple, in marked contrast to the general florid complexion of the patient's face. The right upper lid did not present as great a degree of redundancy as the left, the fullness being most marked at the outer half, but the character of the integument in regard to color, laxness and wrinkling was the same. The subcutaneous contents, especially in the outer portion, seemed firmer than those of the left lid, suggesting the consistency of glandular tissue.



FIGURE 2.

Case 1 four months after operation.

A Wassermann test and search for the *filaria sanguinis hominis* both proving negative, the lids were operated upon October 28, 1913. The brows having been shaved, an incision was made along the full length of the under surface of the rim of the left orbit. A second incision began at the inner end of the first incision and swept downward to include all the redundant tissue, meeting the outer end of the first incision. The integument and subcutaneous tissue thus outlined was excised, the elliptical piece measuring 5 centimeters long by 2.5 centimeters wide at its center. Hemorrhage from the cellular tissue was free and of an oozing character, but could readily be controlled with hot compresses.

As the dissection was continued, soon a long narrow nest of adipose tissue in a capsule was uncovered. This was removed only to be followed by others until five such nests of fat, which came from the upper and outer part of the orbit, had been excised. The lacrimal gland was found to be firmly attached in its fossa. After all the adipose tissue that could be found had been removed the remaining cellular tissue was gathered together deeply and sutured to the periosteum of the orbit with No. 0 chromic catgut. The incisions in the integument were coapted neatly with a continuous silk suture, the line of the incision falling into the natural sulcus of the lid, as illustrated in the accompanying photograph (Fig. 2), taken four months after operation.

The operation on the right eye consisted of an incision beginning at the inner third of the under surface of the rim of the orbit and carried outward and downward, following the rim to its outer angle. A second incision was then made to include all the redundant integument; the flap dissected off was shorter but slightly broader than the flap removed from the left lid. The hemorrhage met with was similar to that of the left eye, and three nests of adipose tissue were found and removed. The lacrimal gland on this side was found to be prolapsed, accounting for the firmer consistency of the right upper lid than the left. The superior or major lacrimal gland was removed, rather free hemorrhage occurring from the lacrimal artery, which was tied with catgut. The same suturing precautions, both deep and cutaneous, were observed as on the left side, and union was prompt and uneventful. The cutaneous sutures were removed on the eighth day.

Microscopic examination.—The excised tissues, consisting of skin, subcutaneous cellular tissue, adipose tissue and lacrimal gland, were submitted for microscopic examination. Technic: Four per cent formalin solution. Hematoxylin and eosin. Weigert's elastic tissue stain.

The stratum corneum in places was markedly thickened, the flat epithelial cells occurring in many layers.

In the corium there was complete absence of adipose tissue and general atrophy or absence of the papillæ.

The stratum reticulare, in sections stained with Weigert's special stain, was poor in elastic fibers, showing a general atrophy and in many places disappearance of elastic tissue.

The subcutaneous cellular tissue showed wide separation of the fibers, many of them crowded together, with enormous spaces between, suggesting a preexisting state of intense edema.

The walls of the blood vessels were uniformly rich in spindle connective tissue cells. Those which ordinarily should be of capillary type had an adventitia one or two cells broad. In short, there was a general hyperplastic condition of the cutaneous vessels with a marked increase in their number.

Sections from the various nests of fat revealed no increase in blood vessels and, in those sections to which the enveloping membrane had still adhered, the membrane was simply connective tissue. The tissue in the sections from the gland removed from the right orbit was normal lacrimal gland, with possibly a slight increase of adipose tissue between the lobules and equally slight hyperplasia of glandular elements.

The cosmetic result has been very satisfactory (Fig. 2). The mechanical ptosis is cured, but the integument, from the brow to the ciliary border of the lids, will take on the peculiar purplish hue, referred to above, during menstrual periods.

Case 2.—Miss M. C., school girl, aged fourteen years, American. Had measles when two years old, chickenpox and whooping cough between six and seven years of age, mumps when eight years old. Began to menstruate between her eleventh and twelfth year. When about eleven years old patient had an attack of dizziness and headache, resembling a bilious attack, which lasted about two days, at which time the lids first became swollen. There have been several subsequent attacks of swelling since then, but none within the past year, during which time she has been under my observation.

The patient is a well nourished, full breasted girl with a sallow complexion and acne vulgaris of the face. She is not of a nervous temperament and is studiously inclined. The appearance of the upper right lid is that of ptosis of the inner half of the lid. The upper left lid droops slightly, apparent only on close inspection. The peculiar feature,

however, is the extremely lax condition of the upper lid integument and its characteristic wrinkled tissue paper appearance.

In the left lid this area of wrinkled skin is small, about the diameter of an ordinary lead pencil.

In the right lid this is much more extensive, the area of wrinkled skin being forced outward in a fold when the lid is raised (Fig. 3). The degree to which the skin can be stretched is inadequately illustrated in the photograph (Fig. 4), as the amount of stretching here illustrated represents only about one-half; it can actually be stretched to the lower rim of the orbit. The wrinkled tissue paper appearance of Fuchs is well illustrated in the enlarged photo-



FIGURE 3.

Case 2.—Illustrating the atonic fold of integument projecting below the sulcus.

graph (Fig. 5) of the right lid. The skin of either lid, when pinched between the fingers, is felt to be thin, with very little underlying connective tissue. There are no masses of any sort that can be felt either by pinching or by palpating the lids, but on introducing the tip of the little finger well under the rim of the orbit above, a rounded elongated mass can be felt and mapped out on each side. It will probably be only a matter of time until these masses, which are undoubtedly adipose tissue, will prolapse into the loose cellular tissue of the upper lids.

From my observations of these two cases, profiting by the reports of Weidler and his review of the literature on the subject, I am strongly of the opinion that blepharo-

chalasis begins with an edema of the subcutaneous tissues of the upper lid, not unlikely an angioneurotic edema, as Fuchs states, and that either recurring attacks or a degenerative process follow which attack the true skin as well as the connective tissue framework of the subcutaneous tissues. This was the condition of the upper lids of my first case, two years and a half ago, and is the present condition of case 2. As the atrophic process advances there results a hernia of the orbital fat or proptosis of the lacrimal gland, due to lack of support in the subcutaneous connective tissue.

Rollet and Grenet,¹ reporting a case of bilateral blepharochalasis, remark on the elusiveness of the orbital tumor



FIGURE 4.

Case 2.—Illustrating the laxness of the atonic integument.

which had prolapsed under the skin of the lids, referring to it as a veritable "souris orbitaire," indicating to them that the fat was not attached but that it came from the orbit.

In a case reported by W. McL. Ayres² no hernia or fat is mentioned. In his case the area of atrophy of the skin was most marked at the outer canthi of both eyes, extending down partially on each lower lid. In this site a hernia of fat would not be so prone to occur as in the more spacious upper part of the orbit.

It is my intention to keep under observation my second case and to note if hernia or fat finally occurs. Certainly there is a mass which can be felt under the upper rim of the orbit in each eye now and which, in my opinion, is orbital fat held back only by the palpebral fascia.

The results from operation should be good if care be taken to close the supraocular space by suturing the remaining orbital fascia to the periorbita.

The primary incision of the lid should be made in the sulcus, and a little more than the amount of integument that seems necessary to correct the fullness of the upper lid should be excised.



FIGURE 5.

Upper right lid of Case 2, illustrating the "wrinkled tissue-paper" appearance of Fuchs of the integument.

Great care should be taken to check and control hemorrhage in all stages of the operation, so that no blood is allowed to drain into the orbit. With a perfectly aseptic and dry operation union should be prompt and the result permanent.

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A NEW OPERATION FOR CAPSULOMUSCULAR
ADVANCEMENT COMBINED WITH PAR-
TIAL RESECTION.

S. LEWIS ZIEGLER, M. D.,

PHILADELPHIA.

Probably the earliest form of advancement of the extrinsic muscles of the eyeball was that of capsulomuscular advancement, which procedure grew out of the expediency of having to readjust certain cases of overcorrection after the operation of tenotomy, which at that time was usually accompanied by a too free division of Tenon's capsule and the consequent protrusion of the globe through the capsular breach.

To Critchett belongs the credit of having first presented a well planned technic for muscular advancement, and it is surprising how many since his time have simply made slight modifications of this method. Landolt gave a great impetus to muscular advancement through his campaign against the failures of tenotomy, which most operators recognized was too radical a procedure as then practiced, and yet they made no systematic attempt to remedy its defects. They were, therefore, quite open to conviction on the points raised in the propaganda preached by Landolt.

Certain features of the necessary technic of this operation have been emphasized by individual operators. Almost all of the earlier surgeons employed the guy-thread to supplement the procedures practiced by them. The pulley principle was made use of by Weber, Prince, Beard and Hulén. The advantages of the single stitch method were emphasized by Williams, Jackson, Oliver and Lea. A circumcorneal interrupted suture was used by Argyll-Robertson, Howe and Cogan to secure a firm anchorage; while true anchor sutures buried in the sclera near the insertion of

the tendon have yielded good results in the hands of Prince, Jackson, Black and Verhoeff.

The tendon was split by Valude before attaching the divided segments to the sclera, above and below. A similar technic was practiced by Emerson. External loop sutures have been employed by Worth and Stevenson, the former tying each one separately, and the latter using them as a slip loop to make uniform traction. Stevens excised a triangle of the tendon without total division and advanced the central portion remaining. Colburn added to this type of excision a splitting of the tendon. Magnani utilized the splitting of the tendon, but without excision.

Lagleyze followed the technic of Williams, but without section of the muscle, thus forming a loop or tuck in the tendon. Suffa employed a more elaborate loop suture and anchored in the tendinous insertion. The more complicated technic of instrumental tucking has been cleverly elaborated by Maxwell, Clark, Bruns, Greene and Todd, while Briggs has added metal clamps to hold the fold in situ.

Resection of the muscle, as performed by Noyes, had a considerable vogue for several years, while Schweigger, Müller and others presented a somewhat more elaborate technic. It has been employed in conjunction with most of the advancement operations I have mentioned. The method recently outlined by Reese has also proved its excellence.

De Wecker began the use of capsular advancement by using the stitch of Weber in a modified way, but Knapp soon improved on this technic by employing Critchett's method of introducing the sutures. The success obtained by Knapp in readjusting overcorrected eyes led me to try it with good results, and later caused a change in the technic of the operation I shall present to you today, by including the capsule in the suture. Fox followed de Wecker's technic, but excised a fold of capsule and conjunctiva. Trousseau aimed to secure a similar effect by his more simple capsular ligature.

Wandering through this wilderness of technic what can we select as the essentials of success in the correction of heterotropia by advancement? The following fundamental elements should at least be given serious consideration:

1. Firm anchorage must be obtained, either in the sclera or in the tendinous insertion of the muscle.

2. Firm fixation of the muscle must be made without strangulation, displacement or tearing of the fibers.

3. A straight parallel pull must be secured by equal traction on each margin of the muscle.

4. Advancement of the capsule will increase the effect, and is especially efficient in readjustment.

5. A single suture has the double advantage of simplicity and efficiency.

6. An external suture is more accessible for removal.

The enthusiasm of the ophthalmic world over the correction of heterophoria and heterotropia which followed the publication of the valuable pioneer studies of Stevens led me in the early nineties to devise a convenient prism scale¹ with a table of resultant prisms, a Greek cross test object for heterophoric examinations² and an operation designated "bilateral partial tenotomy"³, all of which have previously been published, and finally, the advancement operation which I shall here describe. To avoid certain well recognized dangers, I decided to follow the principles laid down in my description of bilateral partial tenotomy, that "by the preservation of a central fasciculus the motility of the eyeball is undisturbed, the traction power of the muscle is retained, its insertion is unchanged and vertical tilting of the axis is avoided." Having this in view, I planned to imitate the technic used in my partial tenotomy and to make a partial resection of the muscle by excising a V-shaped piece from each margin without dividing the central fibers of the muscle. By preserving this central tongue the advancement somewhat resembles a tucking operation, with the knuckle excised, although the distribution of the wrinkles in the muscle gives it more the appearance of crumpling rather than of folding.

MUSCULAR ADVANCEMENT WITH PARTIAL RESECTION AND CONJUNCTIVAL SUTURE.

The description of the operation as first devised is as follows:

First Stage.—A primary conjunctival incision is made 4 mm. from the limbus and extending about 10 mm. in a vertical direction. A tenotomy hook is then slipped under the muscle to raise it up.

Second Stage.—One needle of a double armed suture (No. 1 braided black silk) is now passed through the muscle at its lower marginal third, going from the outer surface toward the sclera, at about 10 mm. back of its insertion. The same movement is then repeated a little in advance of the first, thus forming a secure "whip-stitch" on the edge of the muscle. The second needle is now inserted at the upper marginal third of the muscle and the "whip-stitch" repeated at that point. This gives us a central restraining thread and two lateral binders which will grip the margins tightly without slipping or tearing the muscular fibers.

Third Stage.—The tenotomy hook is now transferred to an assistant, the threads are grasped tightly, the muscle is drawn taut and with small sharp-pointed scissors a wedge or V-shaped piece is cut away from each marginal third of the muscle, thus leaving the fibers of the central third intact.

Fourth Stage.—Grasping the upper needle firmly with the needle-holder it is inserted beneath the conjunctiva at the upper corner of the wound, and pushed rather deeply into the sclera in a diagonal direction, to emerge on the conjunctival surface near the horizontal plane of the cornea. The same maneuver is then repeated with the lower needle and suture, which should emerge near the same spot.

Fifth Stage.—The two free suture ends are now tied in a surgical knot, which is drawn taut until the squint appears to be a trifle overcorrected, when the final knot is tied. The tendon and muscle now appear to be crumpled together somewhat like a tucking advancement, but without the unsightly knuckle. The margins of the conjunctival wound are then approximated over the muscle by two supplementary sutures of thin black silk (No. 0). This makes three sutures necessary for this operation.

The success which I achieved with the capsular advancement of Knapp in many cases of readjustment that were the sequelæ of the older methods, coupled with the ambition to secure equally good effects with my own procedure in similar cases, and a desire to have a single suture do all the work, led me to devise the following modification of this operation, which I have practiced for many years almost to the exclusion of the earlier technic.

CAPSULOMUSCULAR ADVANCEMENT WITH PARTIAL RESECTION.
A SINGLE STITCH METHOD.

First Stage.—A primary incision is made in the conjunctiva, 4 mm. from the limbus and extending about 10 mm. in a vertical direction. Two tenotomy hooks are then introduced from below upward, one beneath the tendon and the other beneath the muscle, both hooks being slightly raised, and the tissues put on a stretch by an assistant.

Second Stage.—One needle of a double armed suture (No. 1 braided black silk, boiled in equal parts of paraffin and vaselin) is entered in the muscle at its lower third and passed from the outer surface toward the sclera at a point about 10 mm. back of its insertion. The same maneuver is then repeated by entering the needle a little behind the first puncture, thus making a firm "whip-stitch" on the lower edge of the muscle. The second needle is now passed in like manner through the muscle at its upper third and again entered 2 mm. behind this point, thus forming a second "whip-stitch" on the upper margin of the muscle. This gives us a central restraining thread and two lateral binders which will grip the margins tightly without slipping or tearing the muscular fibers (Fig. 1).

Third Stage.—Each needle is then separately carried backward beneath Tenon's capsule toward the muscle body on a line parallel with each muscle margin and passed out to the conjunctival surface. With the muscle still held taut, a wedge or V-shaped piece is excised from each margin with a special punch (or with scissors) and the central fibers left intact (Fig. 2).

Fourth Stage.—The upper needle is now carried forward and entered through the conjunctival surface between the limbus and upper extremity of the anterior wound edge, dipping firmly into the sclera and emerging near the horizontal plane. The same maneuver is then repeated with the lower needle and suture, which should emerge near the same spot. The farther apart these needles are entered the more will the muscle be put on a stretch (Fig. 3).

Fifth Stage.—The two free suture ends are now tied in a primary surgical knot which is steadily but firmly drawn taut until the squint is slightly overcorrected. The effect can be graduated as desired. The secondary knot is then tied (Fig. 4)

Care must be taken to smooth out the conjunctiva with a silver spatula before finally tying the suture, as loose tags or small rugæ will prevent smooth healing. The two lines of sutures should be inserted as nearly parallel as possible to prevent any distortion of the tissues. They should firmly close the wound and hold the subjacent tissues perfectly flat against the sclera, and will, therefore, act somewhat as a mattress suture. The muscle, the capsule and the conjunctiva are thus superimposed, fixed and drawn forward to the point of anchorage.

If indications demand it, the pull of the opposing muscle should be weakened either by (a) division of capsular adhesions, if present, (b) stretching of the tendon or of Tenon's capsule, as recommended by Panas and Fox, (c) bilateral partial tenotomy, or (d) complete tenotomy.

The usual after-treatment for advancement operations is indicated. The eye is kept bandaged for one week or less, but the dressing is changed daily. In case of pain, inflammation, or edematous swelling, the dressing should be wholly removed and ice pads applied. The sutures should be removed about the tenth day. This is easily accomplished, as both the knot and the parallel lines of suture are exposed on the outer surface of the conjunctiva.

The advantages claimed for this operation are:

1. Firm scleral anchorage.
2. Whip-stitch fixation of each muscle margin.
3. Splintlike support of the muscle by parallel lines of suture laid across the superimposed conjunctiva, capsule and muscle, all of which are advanced together.
4. Straight traction on both muscle edges.
5. Graduated control while the suture is being tied.
6. Single suture, removable externally.
7. Partial resection, preserving the integrity of the muscle.
8. Tucking or crumpling of the muscle without an unsightly knuckle.
9. Reposition of the globe through advancement of the capsule.
10. Avoidance of the danger of the globe slipping farther back if by accident the suture should loosen or slough out.

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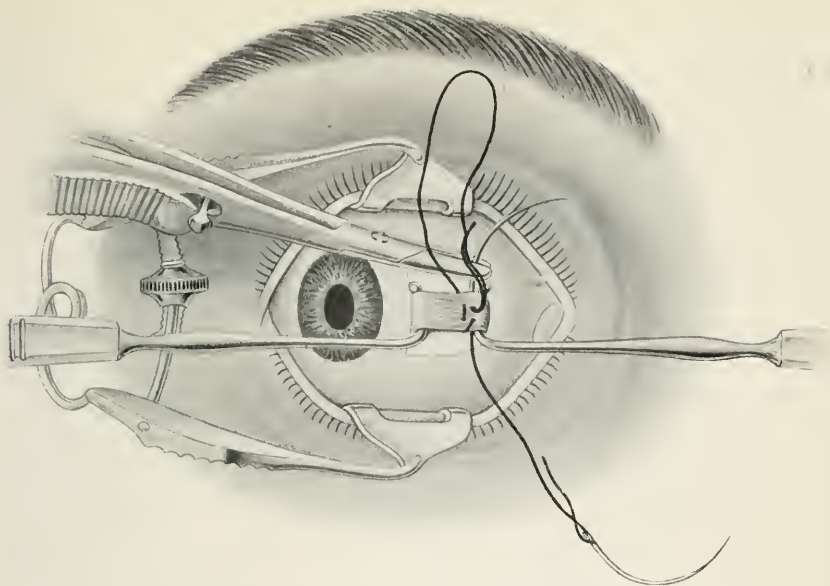


Fig. 1.—First and second stages. The muscle is held taut on two tenotomy hooks. One whipstitch has been placed on lower margin and the other is being inserted at upper margin.

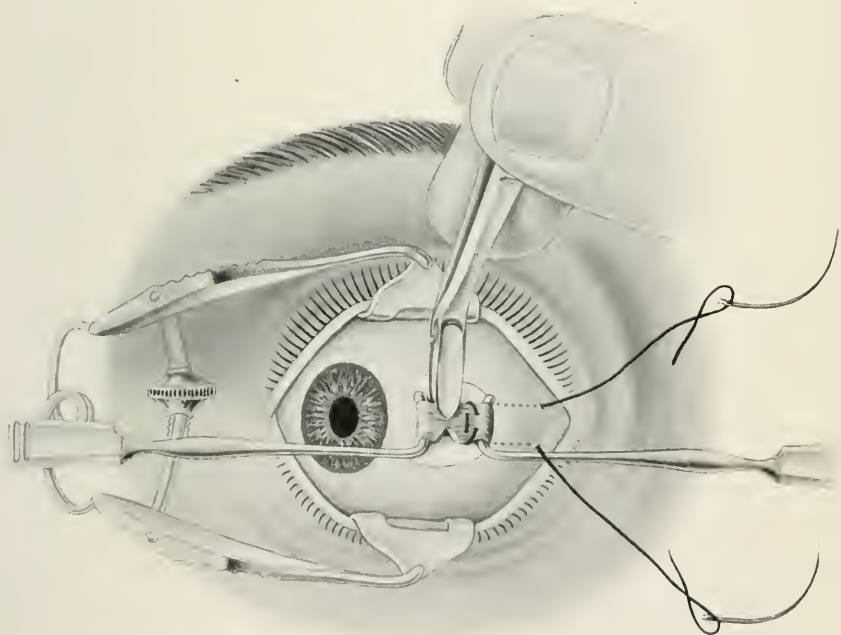


Fig. 2.—Third stage. Both needles have been passed back under Tenon's capsule and out to conjunctiva. A wedge or V-shaped piece is being excised from each margin.

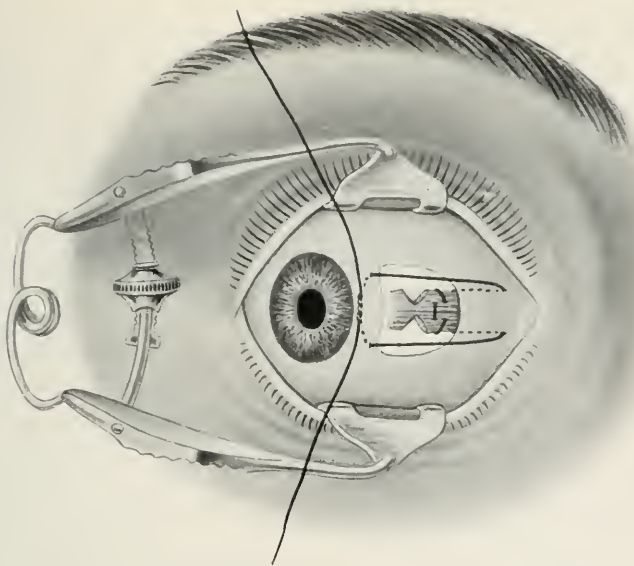


Fig. 3.—Fourth stage. Both needles have been carried forward, passed firmly into sclera near limbus, and ends of suture tied.

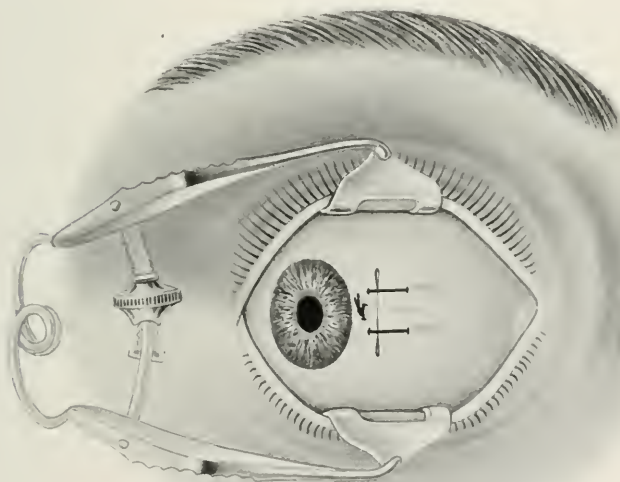


Fig. 4.—Fifth stage. The knot has been firmly tied. Two parallel lines and the knot are left exposed. Tissues are plicated and held flat.

XXVI.

TREPHINE OPERATION FOR GLAUCOMA—LATE INFECTION FROM AN ACUTE CONJUNCTIVITIS.*

MYLES STANDISH, M. D.,

BOSTON.

The failure of an iridectomy to permanently reduce the tension and stay the progress of a chronic glaucoma in a large percentage of the cases has made ophthalmologists eager to adopt any new operative procedure which promises to produce a permanent reduction of abnormal tension.

At present the sclerocorneal trephine operation is on trial. The operation itself is not difficult, and, when a proper iridectomy is done through the opening, the result in most of the cases, so far as we can now see, is a permanent reduction of the tension. There is no immediate falling off of vision, as so often happens after an iridectomy done through a corneal section. It was also hoped that the trephine operation might be a safer procedure in hemorrhagic glaucoma. This, however, as far as the results Dr. Quackenboss has compiled at the Massachusetts Charitable Eye and Ear Infirmary, does not seem to be correct.

Granted that the establishment of a permanent opening through the sclera produces a permanent reduction of abnormal tension, do the changed conditions produced by this opening, and a constant flow of aqueous through it from within the globe into the loose tissues under the conjunctiva, bring with it any secondary changes or dangers to the integrity of the eye?

It is conceivable that this flow may stimulate an increased secretion of aqueous, and that with this increased amount of secretion changes may be produced in the chemical com-

*Read before the American Ophthalmological Society, May 12, 1914.

position of the aqueous itself to the detriment of the health of the lens and vitreous. Possibly increased activity of the ciliary body may produce secondary changes in that structure itself and the iris. The opening itself may endanger the eye by acting as a route of entrance for infection, or foreign bodies from without.

All of these questions we must wait for time and experience to answer, and it becomes the duty of all operators and observers to make careful note and prompt report upon all cases which tend to establish any secondary dangers resulting from this new procedure.

For these reasons, I wish to report as a matter of record the following case:

The patient was a man seventy-seven years of age, who was first seen by me March 29, 1912. He had already lost vision of the right eye with chronic glaucoma. In the left eye he had a vision of 20/30. The nerve was pale and there was a deep depression which did not occupy the whole area of the disc. Tension \pm 1. Under a myotic, vision increased to 20/20 and remained practically the same until April, 1913, when it suddenly fell off to 20/40. He had lost a sector of the field, and the strength of the myotic was increased. Vision remained practically the same until December, 1913, when he returned without my having seen him for three months. I found the vision to be 20/100.

On December 17, 1913, I did a trephine operation under holocain. The trephine button did not come out entire, and was picked up on a sharp hook and cut off, leaving a round, clear opening. The iris promptly presented in the wound and an iridectomy was done. The anterior chamber was rather slow in establishing. On January 9th vision was 20/100. The tension resulting was normal.

The patient was not again seen by me until the 26th of February, when he reappeared at my office, and said that five days before he had retired with his eye as well as ever, and woke in the morning with lids stuck together; since then the eye had been much inflamed and was then worse than it had been. There was present an abundance of mucopurulent discharge, and much congestion of the conjunctiva, and the bleb over the trephine opening was of considerable size and filled with a solid yellow mass. There was a distinct hypop-

yon in the anterior chamber. The infection of the conjunctiva and the hypopyon disappeared in about ten days under treatment. The anterior chamber became very shallow, and a low form of iritis came on during this period, which caused several synechiæ that I was unable to break down, and there were deposits on the anterior and posterior surfaces of the capsule of the lens. The lens itself lost something of its clearness. The iritis promptly ceased under treatment, and since then the opacities on the lens capsule have steadily diminished, but the opacities which remain, taken in connection with the slight disturbances of the lens structure, have reduced vision so greatly that it is with difficulty the patient finds his way about. Tension remains normal.

It is evident that the presence of a subconjunctival opening into the globe may furnish the route for an intraocular infection when an acute conjunctivitis occurs. This possibility must always be considered when choosing an operation for glaucoma, and would seem to be sufficient reason for not selecting the trephine operation in acute glaucoma, where the ordinary iridectomy offers a good chance of a successful result.

It also makes the presence of even a small amount of disturbance of the lacrimal drainage apparatus a condition to be treated seriously. Whether such cases are to be exceptional remains to be seen.

There is some hope that this may be the case, from the fact that the number of infections following the ordinary iridectomy in glaucoma have at the hands of all operators been excessively small. This I have always supposed to be due to the constant outward flow of the aqueous, yet it may be that the difference in the conditions between an open corneal wound and a scleral wound covered by conjunctiva may be such as to greatly change the liability to infection.

My conclusion from this case is that the danger of an intraocular infection from an acute conjunctivitis is sufficient to compel us to warn all such patients that any conjunctival disturbance is to be taken seriously, and promptly treated, or disastrous results may supervene in a case in which a trephine operation has been done.

XXVII.

TUBERCULOSIS OF THE BULBAR CONJUNCTIVA.*

GEORGE F. LIBBY, M. D.,

DENVER.

Tuberculosis of the eye is not rare, but when its description is illustrated by a good picture in colors it seems worthy of being placed on record. The use of tuberculin in ocular lesions is a well established therapeutic measure, but the employment of the direct rays of the sun as a curative measure in tuberculosis of the eye is a more novel method of treatment.

On June 17, 1912, an unmarried woman of forty years was referred to me for conjunctival inflammation, in the service of Dr. Saling Simon, at Mercy Hospital, Denver. Two months before, the cervical glands on the right side had become enlarged, and presented a rather deforming mass in the neck. A month later the inner half of the bulbar conjunctiva of the right eye became red during sleep. On inspection four small, pale, firm, whitish-red nodules were found in the conjunctiva, covering the attachment of the internal rectus; a larger one behind and above these, and also a large, firm, deep-red nodule under the somewhat infiltrated plica semilunaris and pushing it forward. Examination of smears and scrapings from the nodules, by Drs. Simon and Burdick, did not reveal the tubercle bacilli or other microorganism. The apex of the right lung was slightly infiltrated; otherwise there was no apparent pulmonary involvement. An X-ray examination of the chest was not made. The temperature was subnormal in the morning, normal in the evening, while at the hospital.

The local treatment at this time consisted only in cleansing with boric acid solution and the application of heat when the eye felt uncomfortable, which was rarely. The unsightly ap-

*Read before the American Ophthalmological Society, May 12, 1914.

pearance was all that the patient seemed to mind, as to the eye. Tuberculin was administered hypodermically every five days. Reaction in the affected eye was noted after the first injection, and subsequently when the dose was increased. Rest in bed, liberal diet and abundant fresh air were enjoined. On July 30th two pale, flat-round, yellowish nodules appeared on the conjunctiva below the others and toward the plica. The older nodules were slowly subsiding at that time.

When the patient entered the Montcalm Sanatorium, Manitou, August 6, 1912, there had been slight general improvement. On August 11th Dr. Gerald B. Webb, of Colorado Springs, began the use of tuberculin, with $\frac{1}{4}$ cc. of 1/5000 mgm., T. R., which was gradually raised so that 1 cc. was reached by December 9th. Sun baths were ordered for the enlarged glands on August 11th; and on August 21st daily exposures of ten seconds were begun for the conjunctival nodules.¹ On August 28th the conjunctiva was exposed to the direct rays of the sun for sixty-three seconds. This was then ordered to be repeated from two to six times a day. On September 3d the conjunctival inflammation was much better. On September 9th the exposures were increased to three minutes and twenty seconds. The conjunctiva became intensely inflamed on September 30th, and the pseudodiphtheria bacilli were found in the discharge. The sunlight treatment was omitted for two weeks; then resumed for one week, beginning with an exposure of ten seconds, and finally was discontinued, as it seemed to cause slight irritation. It is believed that the patient exceeded instructions as to length of exposures. The first infection subsided in a week. It rekindled on October 21st, but again yielded in one week, the tuberculin not being interrupted either time. By November 4th weight had increased five pounds, and the glands were improved. From this time the conjunctival nodules gradually subsided, and six months later complete cure had occurred, except slight infiltration in and beneath the plica. The patient continued to gain in weight slowly. It should be stated that the preauricular glands were never affected.

On December 16, 1912, 1/20 cc. of 1/2500 mgm., T. R., was given. This had been increased to 13/20 cc. by July 9, 1913, when the patient went to Durango, Colo., for eight weeks. Here she lost twelve pounds in weight, the cervical

glands became more enlarged, and the eye "flared up" and was somewhat painful in the last week of her absence. On her return Dr. Webb resumed the tuberculin, beginning with 6 20 cc. of 1/2500 mgm., T. R., 14 20 cc. being reached by December 30th. Soon after this the patient resumed her work as a teacher. The glands in the neck had diminished in size, the eye was free from inflammation or its effects, and the general physical condition was much improved.

Although the tubercle bacilli were not recovered from smears and scrapings of the nodules, yet their appearance, the affection of the cervical glands and apex of the lung and other physical signs, together with the results from treatment, all indicate a tuberculous conjunctivitis. As the cervical glands became involved two months before the ocular lesion appeared, the latter would seem to have originated in the former and to be secondary rather than primary tuberculosis of the conjunctiva. Whether the glands were infected from an early stage involvement of the right lung or through that common port of entry, the tonsil, or from some other source, must remain an open question.

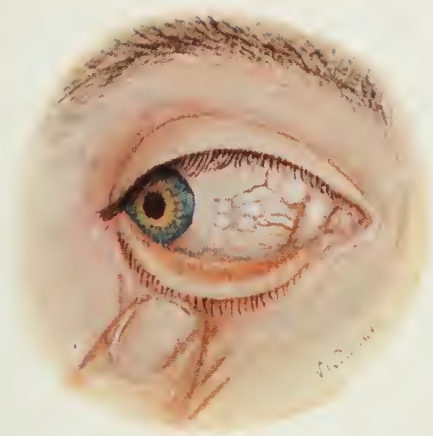
Indebtedness to Dr. Webb is acknowledged for notes on this interesting case after the patient left Denver. In May, 1913, the writer again personally examined the eye with great care at Manitou.

To Dr. William C. Bane is due sincere thanks for the very excellent water color drawing illustrating the involvement of the bulbar conjunctiva, which was made on July 10, 1912.

DISCUSSION.

DR. JOHN E. WEEKS, New York: I should like to ask whether Dr. Libby thinks that the exposure to sunlight had anything to do with the recovery of the patient. Those who treat numbers of cases with tuberculin find that recovery takes place without the use of anything else, aside from keeping the general system in good condition.

DR. GEORGE F. LIBBY, Denver, Colo.: Answering Dr. Weeks, I would say that the inspiration for the use of direct sunlight in this case was the well-marked instance of a medical student in Switzerland, whose eye was infected with tubercle bacilli in opening an abscess, which spurted into the



Tuberculosis of the bulbar conjunctiva.

eye. In that case the nodules were on the palpebral conjunctiva, rather than the ocular. Direct sunlight, without the use of tuberculin, brought about a cure. I know that my case is open to the criticism that it would have recovered any way under tuberculin, without the aid of insolation; yet I feel that it was a good stimulant up to the point when it was discontinued. Then it had become too stimulating and was discontinued for that reason. I think that it was helpful, though not curative.

DR. WALTER L. PYLE, Philadelphia: I desire to report the case of a woman of forty years who came under my care with inflammation of both anterior ocular segments, believed to be tuberculous in nature. She had received repeated injections of tuberculin, with apparent cure, followed by recurrence. I instituted rigorous local treatment with no apparent relief. It seemed to me that the case was hopeless; and in desperation I made an injection of diphtheria antitoxin. Immediately afterwards the eye began to improve. I discontinued all anti-tubercular treatment, and used ordinary local measures for inflammation of the anterior ocular segment, and, although I did not get very much improvement in vision, the eyeballs became quiescent. They are still quiet, eighteen months afterwards. The improvement undoubtedly began immediately after the injection of diphtheria antitoxin. When I first saw her she was just able to walk, from weakness, worry and pain. After the antitoxin there was noticeable physical improvement and evidence of strong metabolic stimulation.

DR. A. EDWARD DAVIS, New York: Though I have not had a case of undoubted primary tuberculosis of the sclera, I am pleased to add to the discussion of Dr. Bell's interesting case by citing a remarkable case of this disease reported by the late Dr. Herman Knapp, in a jubilee volume dedicated to Professor v. Helmholtz on his seventieth birthday, by the Heidelberg Ophthalmological Society.

In this contribution Knapp reports one undoubted case of primary tuberculosis of the conjunctiva; also one case of conjunctival tuberculosis spreading in the well-known manner from lupus nodules in the nose through the lacrimal canal to the conjunctiva.

The case of primary tuberculosis of the conjunctiva was

the result of accidental infection following a subconjunctival squint operation. The patient was a slender, pale girl, nineteen years of age, but in good health, upon whom, in the fall of 1889, Dr. Knapp did an advancement operation of the external rectus and a subconjunctival tenotomy of the internal rectus of the right eye, as a combined operation for marked convergent squint. The wound at the site of the advanced muscle healed in the usual way, and the stitches were removed on the fifth day; but the wound in the conjunctiva just below the tendon of the internal rectus, had a grayish-white coating, and took four weeks to heal. Six weeks after the tenotomy, "the reddened inner half of the conjunctiva was covered with a group of glassy nodules the size of millet seeds." This condition was taken for trachoma and was treated accordingly for several weeks without improvement: in fact, the nodules increased in number and size, and one appeared in the upper retrotarsal fold, and at the same time the preauricular gland became greatly swollen. Tuberculosis was suspected; some of the nodules were removed as well as the preauricular gland. Microscopically tubercle bacilli were found in the nodules, but none in the scrapings from the gland.

The patient was placed on tonic treatment, cod liver oil, nutritious diet, while the local treatment consisted of incision of the nodules, the use of the galvanocautery, and the application of a 1/5000 solution of bichlorid of mercury, six or eight times a day, to the scleral conjunctiva. A year later, May 17, 1891, the eye remained completely cured.

Rabbit's eyes inoculated with the material from the nodules became tuberculous and underwent caseation. Pieces of iris taken from these inoculated rabbit eyes, when stained and examined microscopically, showed tubercle bacilli. Further, a second rabbit's eyes inoculated from the first one became tuberculous and underwent caseation. Without any possible doubt, therefore, the human eye from which the rabbits were inoculated must have been affected with tuberculosis.

As regards the manner of infection in his case, and as to the permanency of cure. I cite Knapp's own words:

"The fact that inoculation in our case was quite accidental needs no proof. The bacilli could not have adhered to the sterilized instruments, but must have got into the conjunctival

sac from the air, and from there been carried into the subconjunctival wound by the squint hook. Examples are known of tubercular infection of other wounds. Tillmanns says: 'It is important for the surgeon to know that tuberculosis of the skin and of the lymphatic glands has been observed, particularly after scratches, skin eruptions, and ulcers. Czerny in two cases saw tubercular inoculation after skin transplantation.' "

Notwithstanding the complete recovery of the patient described in Case 2, I am not very sanguine as to the permanent cure of the conjunctival tuberculosis. We must remember how long a local tubercular process may lie dormant; and it seems to me doubtful whether conjunctival tuberculosis as well as lupus of the skin and mucous membranes is ever permanently cured. There is a possibility of it, certainly. That the process may remain local and need not necessarily poison the organism is shown by numerous observations as well as by the cases in which an inoculation tuberculosis has remained local. The eye was destroyed, but the animal lived, and when killed years afterward, tubercles were nowhere to be found. The tuberculosis in each eye of the rabbit in our first case, inoculated from an iris tuberculosis in man, healed not only without spreading of the veins, but with preservation of the organ primarily affected.

DR. SAMUEL THEOBALD, Baltimore, Md.: May I ask Dr. Libby and Dr. Bell whether the tubercle bacillus was found in the cases, or whether an effort was made to recover it from the ocular areas of inflammation? The focal reaction, of course, was very significant; but the recovery of the bacillus from the diseased tissues would more definitely clinch the diagnosis.

DR. LIBBY: In answer to Dr. Theobald, I may state that we did not get the bacilli from the scrapings. I should also like to add one other word. You have all doubtless noticed that in Switzerland, of late, good results have been obtained in the treatment of bone and visceral tuberculosis by direct rays of the sun; and the inspiration for their use in my case was the success met with in Switzerland. It seems to me that in high altitudes at least, where the sun's rays are so abundant and this treatment is ready to hand, insolation constitutes a rational therapeutic procedure.

DR. GEORGE H. BELL, New York: My case was in a private patient. When we got the local reaction, and also the constitutional, I did not think it well to subject her to the microscopic tests. We could not very well do it, as she was a lady and a private patient.

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XXVIII.

A CASE OF TOTAL COLOBOMA OF THE OPTIC NERVE ENTRANCES.*

BURTON CHANCE, M. D.,

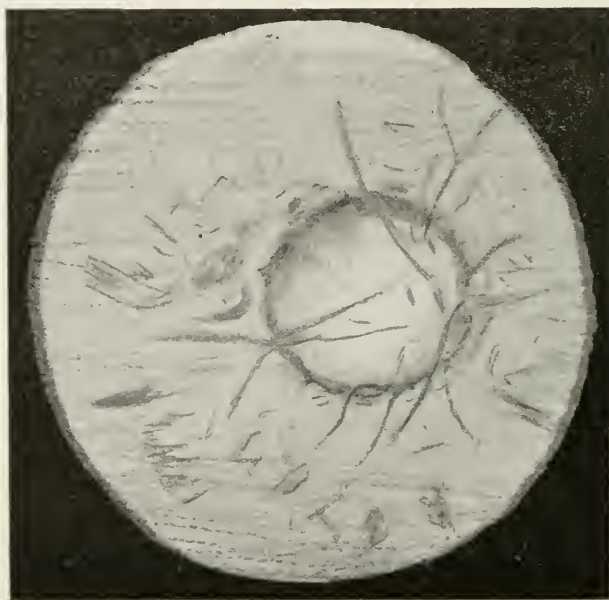
PHILADELPHIA.

While it is true that coloboma of the optic nerve entrance, unaccompanied by mutilation of the choroid, is a rare anomaly, it has been my good fortune to have seen quite a large number of cases showing greater or lesser defects, as for instance, "crater-like pits" and "holes," confined to the nerve. In the past year or so I saw in the eyes of a young French Jewess, at the Wills Hospital, almond-shaped pits confined to the nasal half of each disc, and in neither eye were there signs of choroidoretinal defects. But the case to be presented is that of complete excavation of the optic nerve entrances without visible imperfection of either choroid, which I discovered in the eyes of a lady beyond middle age, who consulted me in October, 1905, for the relief from a form of keratitis about which I may communicate the details at some future time. The corneas had been attacked repeatedly during the past ten years, and at the time she consulted me they were so scarred as to obscure the ophthalmoscopic views.

The globes were full size, and the anterior segments presented no developmental abnormalities. The right disc appeared like a large horizontal ovoid, thrice the size of the natural nerve entrance. It seemed to be more like a porous opticus; or rather, the fundus seemed as though the nerve had been pulled out of the sclera, as there was total excavation with none of the characteristics of a normal disc present. At first sight the excavation was not unlike what Beard likens to a "magnified glaucomatous excavation." The sketch is approximately the ophthalmoscopic size.

*Read at the meeting of the Section on Ophthalmology, College of Physicians, April 16, 1914.

The lamina seemed to be wanting; on the contrary, the nerve resembled a deep funnel, the sides of which were of a glistening green, and altogether void of pigment. The temporal side sloped more than the nasal. The apex could not be made out, as it was many diopters, perhaps thirty, deeper than the rim. The sloping sides were relatively smooth, for they were without pits or caverns. At the scleral edge were a number of straight unbranched vessels



which seemed to come from a depth beyond the sclera. The vessels came out of the depths, with no certain point of origin, though they came chiefly from the nasal side; direct shoots reached up to be distributed, without branchings, on the retina. The temporal artery stretched across the funnel from what seemed to be the point of its entrance at the apex to the temporal edge of the rim. The veins appeared to come from a trunk somewhat in advance on the nasal slope. The nasal vessels, arteries and veins accom-

panied each other. Three separate twigs came over the rim at the lower border.

The rim of the funnel, which overhung the cavity, and had the appearance of being on a single vertical plane, was faintly bordered by pigment. This ring seemed to be less pigmented than pigment rings generally are. Here and there were reddish splotches, as though choroid and retina had encroached upon the rim. The retina and choroid, throughout the fundus, were everywhere complete, but radiating some distance from the disc, except directly above, were flame-shaped clumps of pigment. The general tint of the fundus was paler than usually seen in black haired individuals, and the general fundus level surrounding the nerve entrance was emmetropic. The visual acuity equaled 5/15, which may be said to have been normal when one considered the opacification of the cornea.

The left eye much resembled the right. I have no sketch of it. The nerve entrance was vertically oval, with a deep central excavation. The surface of the excavation out to the edge appeared like the densely striated and glistening surface of the sickle in a well marked connective tissue conus, or as in Fuchs' coloboma. The funnel was not so sharp nor so deep as in the right. The vessels were more regularly grouped and centralized. Everywhere the fundus was much pigmented and tessellated, but there was no colobomatous area in the choroid.

The patient's two children have perfectly formed eyes.

It is extremely difficult to speak with absolute certitude and to accurately describe the condition of such malformations; indeed, in the absence of an actual dissection, one can speak of them only as they appear to be in the ophthalmoscopic picture. I imagine that in this present case the lamina of the right nerve had been displaced to the temporal side—that is, the nasal extremity of it had failed to become attached, so to speak—and the whole plate, being hinged at the temporal, had fallen or swung backward and became the sloping temporal side of the funnel. The absence of the support of the lamina favored the production of an ectasis from the pressure of the intraocular fluid.

The relative position of the choroid and sclera at the periph-

ery of the nerve entrance was not disturbed, a condition which leads one to speculate as to the cause of the defect: it is conceivable that as the fetal choroidal cleft was completely closed, some force interfered with the proper development of the neural stalk, some abnormalities, perhaps, in the vascular element, and, the pressure continuing, the nerve fiber elements became spread over the sides of the funnel equally, it may be presumed, because the patient had perfect and useful sight prior to the incidence of the keratitis.



Dr. Crampton, in his admirable paper describing "Two Cases of Binocular Coloboma of the Optic Nerve in the Same Family," published in the *ANNALS OF OPHTHALMOLOGY*, January, 1914, page 53, has quoted generously from a case of total coloboma which I reported in 1904. Through the courtesy of the American Medical Publishing Company, I herewith exhibit the colored drawing illustrating that case, as the case was not reported at a meeting of this section, but was

published together with a group of congenital anomalies of ocular structures, in Volume 8 of *American Medicine*, page 593, and I venture to use it again at this time, in order to classify it with coloboma of the nerve entrance.

One is tempted to speculate on the origin and import of such anomalies of structure. Undoubtedly the defects are the product of physiologic aberrations, or else they are the results of positive disease occurring in intrauterine life. Aside from the functional defects which usually accompany the anatomic imperfections, it is interesting to note that while most of the works touching on the subject of psychical degeneracy have included in them lists of congenital malformations of ocular and other nervous structures, which defects are believed to contribute to such degeneracy, in a large series of such presumed to be degenerates I, myself, found very few malformations. On the contrary, I can recall but one case, that of a child with aniridia of each eye, as total as I have ever seen, whose mentality was not of the brightest. Indeed, all of the cases of uveal colobomata, with this exception, I can remember, have been in those of unusual mental capacity. In a systematic and routine study of the patients at the Pennsylvania Hospital for the Insane, extending over two winters, I found but two or three instances of deformed eyes.

XXIX.

REPORT OF A TRAUMATIC PARALYSIS OF BOTH EXTERNAL RECTI.*

FREDERICK E. WOODRUFF, M. D.,

ST. LOUIS.

I wish to report this case separately simply because it is one of interest to me, for I had never seen such a case, and was at first somewhat at a loss as to the exact location of the injury. I am somewhat at a loss yet.

About the 25th of March, Richard L., a boy four and one-half years of age, fell through a cellarway a distance of eight feet, striking on his shoulder and showing a slight abrasion at the side of the nose. Those were the only marks of injury that could be found. Ten days after the injury I was called to see the patient, and could find no evidence of eye disturbance except a double convergent squint with a paralysis of both external recti. The convergence was possibly exaggerated, but he certainly had no power over either external rectus. I was told that at the time of the injury and for a week afterwards he had had no temperature, no signs of any paralysis except the ocular paralysis, no hemorrhage of any kind, no trouble with the ear, no sign of fracture at the base, only a concussion of the brain, with this double external paralysis and internal convergence. No treatment had been instituted beyond a slight purging and keeping the child as quiet as possible in bed.

In about three weeks the left eye began to have slight movement beyond the median line, and up to about three days ago there was no movement in the right eye beyond the median line. The child is up and about and plays as usual. I have taken his refraction, which is about two diopters of hypermetropia, and have given him about one diopter correction, thinking that he might not accept the full measure, and am

*Read before the Ophthalmic Section, St. Louis Medical Society, May 6, 1914.

trying to give him not too much. So much for the report of the case.

The abducens nerve has its nucleus beneath the floor of the fourth ventricle, in the knee made by the fibers of the facial nerve as they pass upward and then outward. It is not probable that any of the axis-cylinder processes of these cells are associated with the fibers of the facial nerve. The fibers of the abducens nerve on leaving the dorsal and inner sides of the nucleus pass ventrally and make their exit at the junction of the pons with the medulla oblongata and near the median line. The nucleus is placed a little more cerebralward than is the point of exit of the nerve, consequently the fibers pass a little spinalward in their exit from the brain stem. The close association of the abducent nucleus with the fibers of the facial nerve explains the occurrence of paralysis in the distribution of these two nerves when a lesion is situated in the lower part of the tegmentum of the pons. The nearness of the two abducent nerves to one another at their point of exit from the pons explains the paralysis of both external recti muscles in basilar meningitis. At the point of exit at the junction of the pons and the medulla, the fibers of the abducent nerve become united into one bundle. From here to the exit from the skull through the sphenoidal fissure, the course of the nerve is long, and, consequently, paralysis of the external rectus muscle is not uncommon from intracranial lesions.

Double sixth nerve paralysis is relatively frequent in basal disease, when the latter is situated centrally in the posterior fossa (when both anterior pyramids of the medulla may be pressed upon, with consequent motor symptoms in the limbs). Monolateral sixth nerve paralysis is also not infrequent from pressure as a result of fracture of the base. The sixth nerve is liable to be injured, owing to its intimate connection with the dorsum sellæ and the periosteum in the neighborhood of the apex of the petrous portion of the temporal bone, which latter it is stated is very apt to be cracked in these cases. It is recognized that sixth nerve paralysis may be caused by fracture of the base without coma, paralysis of other cranial nerves, or the usual symptoms of basal fracture being present. In such cases, it may not be possible to say, especially if both sides be implicated, whether the lesion is basal or nu-

clear; if the lesion appears only partially, it points to nuclear lesion, especially if polyuria is present.

I will also say that there was no polyuria present in this case; nor was there sugar present in the urine, as is sometimes found in lesions of the fourth ventricle.

E. A. Shumway, in a recent paper on traumatic paralysis of the external rectus, gives the following statistics regarding the frequency of abducens paralysis: Van Nes, in 1897, found three cases in eighty-two fractures of the skull; Brun, in 1903, found it but ten times in four hundred and seventy cases; Graf (1903), four cases out of ninety; Liebrecht saw five in one hundred cases. Purtcher, writing in 1888, had collected forty-six cases of intracranial traumatic abducens paralysis, thirty-six of these being probably direct, while eight were secondary results of the traumatism. The paralysis was unilateral in thirty cases, bilateral in thirteen, and three cases undetermined. See Shumway's article for citation of a case of his own and references to a few others.

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XXX.

THE TREATMENT AND INDICATIONS FOR OPERATION IN GLAUCOMA SIMPLEX.*

HARRY S. GRADLE, M. D.,

CHICAGO.

Glaucoma is a disease, a symptom of which is an increase in intraocular pressure. In the inflammatory types of glaucoma, this symptom is predominant, in that every other phase of the clinical picture is subordinate to the increase. But in the noninflammatory type, or glaucoma simplex, the increased intraocular pressure, although prominent, does not play the exclusive leading rôle. It is with this type of the disease that this paper deals, and I shall confine myself to a discussion of the predominant symptoms, from a therapeutic and operative standpoint.

The cause of the increase in intraocular pressure is still unknown, and no theory that can answer all of the questions presented has ever been propounded. A large percentage of ophthalmologists believe, with Thompson Henderson, that an intimate relationship exists between intraocular pressure and blood pressure, and, accepting this view, have endeavored to exert an influence upon the glaucomatous eye by systemic measures aimed at the vascular hypertension. Laquieze claimed that in sixteen out of nineteen cases the arterial lesion was elevated above the normal. If we accept the view that the aqueous humor is partially a secretion and partially the result of osmosis, such a relationship would seem plausible. But, as has been definitely proven, the degree of osmosis involved in the production of the aqueous is far overshadowed by the other factors, and consequently the influence of vascular hypertonicity is correspondingly small. Kraemer examined

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forty-five cases of glaucoma simplex, and found arterial hypertension in only sixteen, or 35.6 per cent. On the other hand, among ninety individuals of the same age as the glaucoma patients examined by the same investigator, there was abnormally high blood pressure in 33.3 per cent. On this basis the blood pressure would amount to about two per cent of all of the factors involved in the production of ocular hypertonicity. I believe that to be about the correct figure.

But there is no question that the ocular tension can be influenced from a systemic standpoint. Wessely was able to demonstrate conclusively that the intravenous introduction of certain drugs that decreased the blood pressure by the dilatation of the intracranial vessels, as amyl nitrite, caffeine, etc., caused a measurable increase in intraocular pressure.

Recently, Hertel published an extensive series of interesting experiments in this connection. He introduced large amounts of salt solutions of varying concentrations into the vascular system of rabbits, and carefully measured the changes in the intraocular pressure with the Schiötz tonometer. The concentration and the amount of the solutions used eventually killed the animals, but it was shown that concentrations of 0.7 per cent and greater, up to 10 per cent, invariably reduced the tension, so that just before death the eyeball became mushy. On the other hand, solutions of less than 0.7 per cent in strength resulted in a marked rise in tension, simulating a glaucoma. The same author was able to cause a marked diminution in tension by the intravenous use of diabetic serum, basing his experiments upon the clinical fact that in diabetic coma (and in no other form of coma) there exists a marked hypotonicity. The acidosis theory, advanced by Fisher, and the treatment of the disease based upon this theory, has been universally discarded.

However, the tension of the eye, whether normal or increased, can be depressed by manipulations other than the use of miotics. I refer to massage. Knapp showed in 1912 that the tension of a normal eye could be reduced 8.91 millimeters of mercury by three minutes' deep massage of the eyeball. True, this hypotonicity disappeared within twenty to twenty-five minutes, but it proved that massage dilated the normal intraocular outlets temporarily and led to a more rapid filtration of the aqueous. A glaucomatous eye may or may not

yield to massage with a reduction of the hypertension, depending upon the balance of the intraocular fluids. If the intraocular outlets are patent to a minor degree, or if they possess the potentiality of being opened, we have an indication from the massage that the disease may yield to conservative treatment. But if no reduction in hypertension, or at the most a very slight reduction, follows the massage, we are justified in assuming that operative interference will be necessary to reintroduce the intraocular pressure balance. More or less empirically speaking, a temporary reduction of at least four to six millimeters of mercury should result from three minutes of deep massage to prove the potential patency of the outlets.

To judge of the prognostic value of massage, skill with the tonometer is essential. This invaluable instrument was first introduced to ophthalmology by Professor Schiötz in 1907. Since then he has perfected three improved models. Three years ago we published a mechanical modification of the Schiötz tonometer, employing the same basic principles, but eradicating the technical defects. The readings with the two instruments coincide to within one millimeter of mercury. In using either of the instruments an absolute corneal anesthesia is essential, and for this a 1 per cent solution of holocain has proven the best. I do not intend to speak of tonometry at length, but do wish to emphasize one point, the disregard of which causes the majority of errors that occur in the use of the instrument: The anteroposterior axis of the eye must be absolutely vertical and the tonometer must be so placed as to be a direct continuation of this axis.

There is one other danger signal in glaucoma simplex upon which we can place a certain dependence. I refer to the visual fields. But I do not believe that a careful and daily study of this factor will yield a large amount of reliable information, nor do I believe that we can place a great dependence upon such results. There is a great variance in any one individual's visual fields from day to day, and even from hour to hour, depending upon the illumination, upon the physical condition of the patient, upon the mental acuity, upon the quickness of the association paths, and upon other factors too numerous to mention. In other words, the visual field factor is alto-

gether too subjective a matter to permit of the detection of delicate changes in the course of the disease.

The other signs and symptoms of glaucoma simplex are of no great value from the prognostic standpoint. We are thus forced to judge of the value of our therapeutic measures from three angles: First, the curve of absolute intraocular pressure, tonometrically registered. A curve should be plotted for every patient, with readings made at least twice a week. The course of this curve is a fair indication of the immediate value of the miosis induced. Second, examination of the patency of the intraocular outlets. At the first examination of the patient the tension of the eye should be measured before and after three minutes of deep massage of the eyeball, and this should be repeated every two weeks. Should there be a diminution in pressure of less than four to six millimeters of mercury, we must keep before us constantly thoughts of operative interference. Third, examination of the visual fields. This should be done every two weeks and gradual contractions carefully watched for. But, to my mind, this is the least important, or, rather, the least dependable of the three factors.

In glaucoma simplex, therapeutic measures must be given an exhaustive trial before operative interference may be resorted to. Our main reliance lies, of course, in the use of miotics; although measures directed toward the attainment of a perfect physical condition, toward mental rest, etc., must not be neglected. Eserin must be used cautiously, in that a single instillation may superinduce an attack of acute inflammatory glaucoma (Wessely), while continued use can lead to an obstinate chronic conjunctivitis or a low grade iridocyclitis. A 2 per cent solution of pilocarpin nitrate yields better results, and is less apt to lose its efficacy in the long run.

After the diagnosis has been established and the various tonometric and perimetric readings recorded, the miotic treatment may be begun. The pilocarpin solution should be used from three to eight times in the twenty-four hours, depending upon the extent to which the eye reacts. This treatment, which I designate as intensive, must be maintained for at least two weeks, irrespective of its success or failure. Then another careful examination, including the effects of massage, should be made. If no change in the existent conditions is

recorded, the intensive treatment should be continued from two to six weeks longer, depending upon the severity of the symptoms, before operative interference is indicated.

If, however, an amelioration of the condition is found, a two weeks' period of moderate treatment may be entered upon. This consists in one or two instillations of pilocarpin daily, accompanied by a slight relaxation of the vigorous hygienic treatment and mental rest. During the first few days of this period the eye must be carefully watched for an increase in the severity of the disease.

Should the glaucoma continue to yield to a two weeks' course of moderate treatment, we may further diminish our therapy to the minimum treatment. This consists in allowing the patient to resume the former course of life, necessarily modified enough to be in conformance with modern hygiene, and the use of a single drop of 1 per cent or weaker pilocarpin every two or three days.

A fair majority of the cases will yield to the intensive treatment, while only a few are entirely uninfluenced by the miotics employed. But not many of the cases can be allowed to pursue the even tenor of their ways under the minimum treatment. The majority either require moderate treatment or operative interference. It is very difficult to lay down empirical indications for operation, as each case is a law unto itself. But we may say that a horizontal curve, or a rising curve of tonometric pressure, that a failure to decrease the intraocular pressure more than four millimeters of mercury by three minutes of deep massage of the eye, that a gradual contraction of the visual fields, and that a gradual diminution of vision, form the boundary posts dividing the therapeutic and surgical aspects of glaucoma simplex.

What operation is to be performed when necessary? We may divide the operations aimed against glaucoma simplex into three classes: First, those opening the normal intraocular outlets, as the iridectomy is supposed to open the canal of Schlemm; second, those opening new intraocular outlets, as the cyclodialysis that frees the path between the anterior chamber and the suprachoroidal spaces; third, those opening extraocular outlets, as trephining.

Despite the successes recently reported by Evans and Butler, public opinion does not favor iridectomy in glaucoma simplex.

From the masses of statistics at our disposal, it is probable that this operation is not successful in more than fifty per cent of the cases, and even when successful in lowering the tension, at times blots out the small remaining visual field, so that, from the standpoint of the patient, the operation is a failure. This latter feature is not confined to iridectomy alone, but also appears after trephining. This has happened to three cases that I trephined, and, although six months have elapsed, the vision of these patients is still only quantitative. Consequently, I prefer to perform a cyclodialysis as the first operative procedure in glaucoma simplex. The results of this operation may be divided into three classes: First, permanent cure; second, relief of symptoms, lasting from six months to three years; and, third, failure. Sixty per cent or more of the cases will fall under the first two headings, and by far the majority of these under the second. But the cases of class two are amenable to another cyclodialysis, performed six months to three years later, and the disease may be kept in check by the performance of this simple operation at repeated intervals. I have in mind one patient in whom we have held a malignant form of the disease at bay for nearly eight years by three cyclodialyses. Especially in patients with but one eye is this course of treatment advisable. However, if the operation proves to be a failure within a month or so, it is useless to attempt to repeat it.

In about forty per cent of all cases the cyclodialysis operation will have shown itself to be a failure in less than four weeks. We are then forced to further operative interference. The modern tendency has been toward the various sclerotomies (Herbert, Holth, Lagrange, and Elliot). It is only with the latter that I have had any experience, although the same dicta hold true for all operations of this class. The primary results are excellent, and we may count upon conquering the disease in about eighty-eight per cent of all cases. But the secondary dangers, and by that I mean late infection, are so great that we must hold the operation as a last resort. Keeping in mind the statistics of Meller, and the numerous late infections reported in the recent literature, are we justified in exposing a patient to the dangers of panophthalmitis, a danger that will be present for the remainder of his life? In clinical patients, over whom we have no further control, most

emphatically no. In private patients, intelligent enough to understand the dangers and to comprehend the prophylaxis, we may take the risk, rather than lose the eye by the steady inroads of the disease.

CONCLUSIONS.

There are three main prognostic features to glaucoma simplex upon which we depend for indications for operative interference. These are:

1. The curve of intraocular pressure, tonometrically registered.
2. The influence of definite limited massage upon the existent intraocular pressure.
3. The visual fields.

These factors should be carefully studied over a period of weeks, and upon them must depend our decision to interfere with operative measures.

In case operation becomes necessary, it is advisable to attempt a cyclodialysis. Should this be successful, a minimum of harm and a maximum of good has been done. Should the procedure, however, prove of no avail, we are then justified in resorting to an operation of the third type—a filtration operation. This type should be reserved as a last resort, especially in the case of clinical patients.

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ABSTRACTS FROM ENGLISH OPHTHALMIC
LITERATURE.

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Holth's Punch Operation for Glaucoma.

BUTLER, T. HARRISON (*Ophthalmoscope*, June, 1914), reports twenty-nine cases of glaucoma, acute, subacute and chronic, operated by the Holth sclerostomy. He prefers it to the Elliot operation because he believes it to be easier and more accurate, except if the anterior chamber is very shallow, in which case he performs the latter.

A model of punch is used, much slighter in build than the original, and a short narrow keratome, both designed by the writer.

The technic of the operation is as follows: The usual Elliot flap is cut and reflected down to the limbus with squint

scissors. The cornea is then split with a small scalpel far enough to bring the opening close to the cornea, but not necessarily into it. The flap is held down with fine forceps which have no teeth, and the point of the knife entered at a spot one and one-half millimeters from the limbus. The flap is replaced over the knife by the assistant, and the instrument is pushed forward till its point is seen in the anterior chamber. The patient must then look down while the punch is inserted slowly and the scleral disc punched out. It must be noted that the cutting blade is underhung, so that the lower (female) blade must be passed in further than may appear to be necessary. A D-shaped orifice results which should just include a portion of the cornea. If any iris prolapses, it should be seized and excised. Otherwise, if an iridectomy be desired, the iris should be withdrawn with Liebreich's (Matthieu's) forceps. The flap is finally replaced and held in place with a suture. The eyes are covered with a double pad for forty-eight hours and then inspected. If there be any undue injection, atropin is instilled.

Iridectomy is held to be necessary for three reasons: (1) Fear of prolapse; (2) wick-like action of the cut iris, allowing the aqueous to enter its lymph spaces and reach the channels of exit; (3) a fistula may be kept permanent because lined by pigment cells derived from the cut iris.

Only six of the twenty-nine operations were failures, four of which were due to defective technic, one from late infection, two because the piece removed was too small; one, in spite of good filtration, failed to relieve the tension; one because the operation was blocked by iris tissue, and one because the aperture was blocked by vitreous. Only three cases developed slight postoperative iritis. W. R. P.

Tenoplication—A Method of Advancement Without Resection of Tendon for Convergent Squint.

WORTON, A. S. (*Ophthalmoscope*, June, 1914). The operation, as described, briefly consists of a simple carrying over of the external rectus tendon with the conjunctiva and capsular tissue, and reattachment further forward without tenotomy or resection of the tendon.

The best results are obtained from squints of the alternating variety with good vision in each eye and normal muscle movements. The only special instrument required is a flat

tendon guide with angled handle, on which the tendon lies, and which is made in two sizes, eight millimeters and ten millimeters respectively. It can be used for either eye with equal facility. The larger size is usually employed for adults, the smaller for younger patients; or where there is less room than usual on account of deeply set eyes or other cause. The outer edge is notched in millimeters, and the guide is flanged so that the tendon lies snugly on it, so that it is practically self-retaining during the operation.

Technic.—Under local anesthesia the conjunctiva is picked up with forceps about four millimeters from the corneal limbus, and reflected precisely as in the usual advancement operation.

The parallel fibers of the external tendon are then defined, and with a snip of the scissors a buttonhole is made through the loose subconjunctival tissue and capsule, just above, and then below, the margin of the tendon, close to its insertion. A tenotomy hook is then passed underneath the tendon and held in the left hand of the operator, who then frees the tendon by blunt dissection with a closed scissors as far back as necessary to permit of the introduction of the tendon guide. Directly the guide is passed beneath the tendon the tenotomy hook is withdrawn. An assistant then takes charge of the guide, holding the handle from below in the case of the right muscle, and from above in the case of the left external rectus. This is done to facilitate the passing of the sutures. Three curved needles carrying double threaded No. 1 silk are in readiness, and taking one in a needle holder the operator picks up the middle of the cut reflected conjunctiva with forceps, and passes the suture through it and then transversely through the tendon, lying on the guide in such a manner that the middle third of the tendon is included. The emerging thread is passed behind the entering thread of the tendon suture, and finally carried forward to the sclera, taking a deep hold here, and on out through the inner cut edge of conjunctiva. The needle in passing through the tendon is made to impinge directly on the guide, to make sure that the whole thickness of the tendon is transfixed. The suture when passed as described is then loosely tied for purposes of easy identification.

The other two sutures for the upper and lower thirds of the tendon are passed in exactly similar fashion, taking con-

junctiva, capsular tissue and tendon, and are then brought forward to the scleral attachment and made to include the cut edge of the conjunctiva on the inner side. The sutures being passed, the guide is withdrawn. If it be desired to do a tenotomy of the internal muscle, it is done at this stage; otherwise the sutures are tightened, the surgeon bearing in mind the desirability of overcorrection of the deviation at the time of operation.

In actual practice the writer has obtained a shortening of twelve millimeters with a correction of twenty-five degrees to orthophoria and binocular vision. W. R. P.

Alternating Hyphema—An Unusual Result of Concussion of the Eyeball.

BALLANTYNE, ARTHUR J. (*Ophthalmoscope*, June, 1914). A unique case is recorded, namely, the disappearance of a hyphema on fixation of a near object, and its reappearance on relaxing the accommodation.

A patient, a man forty-eight years of age, was struck on the right eye by a stone on the 24th of February last. When he appeared at the eye infirmary on the 28th there was a small cutaneous ecchymosis over the right cheek bone, a rupture of the conjunctiva bulbi about twelve millimeters long, parallel with and about four millimeters from the lower inner margin of the cornea, and a deposit of blood in the lower angle of the anterior chamber, reaching to a little above the lower margin of the pupil, the diameter of which was three millimeters. The blood was fluid, and occupied the most dependent part of the anterior chamber at whatever angle the head was held.

The feature of the case which at once arrested attention was that when he directed his gaze to a finger held six or seven inches from his face there was at once a considerable fall in the level of the hyphema, and then a more gradual fall until, in the course of about five to ten seconds of maintained fixation, all trace of blood had gone from the anterior chamber, leaving merely a little greenish staining of the lower part of the iris. When he was instructed to look again into the distance the blood rapidly reappeared, apparently from the lower angle, and after one or two repetitions of the experiment was actually greater in amount than at the first examination.

A drop of atropin was instilled into the injured eye, and during the following two days, while the eye remained under the influence of the drug, the to and fro movement of the blood could not be demonstrated. By the next day, however, the pupil had returned to a diameter of about 5.5 millimeters and reacted slightly both to light and to near vision, and the disappearance and reappearance of the blood could be elicited as before. The last day on which blood was seen in the anterior chamber was the 8th of March, the twelfth day after the accident, and it was still possible to bring about diminution of the hyphema by fixation of a near object, although the disappearance was neither so rapid nor so complete as at first.

Over and above this alternation of the hyphema which one could produce at will so long as there was blood in the anterior chamber, the size of the hyphema varied much from day to day, on account of the fact that after more or less complete absorption fresh extravasation of blood occurred.

The manner in which the blood stained aqueous disappeared, even when it was in sufficient quantity to occupy nearly one-half of the anterior chamber, and the apparent localization of the exit near the center of the lower angle, suggested the presence of a recess of limited circumferential extent, but capable of accommodating a fair quantity of fluid.

The opinion seems justified that this is a case with a separation of the ciliary body from its scleral attachment at the inferior angle of the anterior chamber, allowing a free communication between the chamber and the suprachoroidal space; that the blood in the anterior chamber originated in the rupture of vessels of the suprachoroidal space; and that during contraction of the ciliary muscle in accommodation, the ciliary body, and perhaps the anterior part of the choroid, was drawn away from the sclera, chiefly by the contraction of the circular fibers of the ciliary muscle, the neighboring aqueous flowing into the space so formed, and flowing out again into the anterior chamber on relaxation of the ciliary muscle.

W. R. P.

Periscopic Lenses.

PERCIVAL, A. S. (*Ophthalmoscope*, July, 1914). The object of the paper is to show how menisci can be ground with ordinary spherical surfaces for strengths up to $+7$ D. or $+8$ D., which will serve satisfactorily for reading purposes.

It does not lend itself to abstracting because of the mathematical detail, and must be read in full to be appreciated.

W. R. P.

Diplopia Polyopia in Connection With Astigmatism.

BARRETT, J. W. (*Ophthalmoscope*, July, 1914), has attempted to determine why astigmatic patients frequently see a duplicate of the line they are looking at above or below it, which disappears when fully corrected.

A series of experiments was conducted with Snellen test type, more especially the letters "O" and "I," at 1.5 meters distance, viewed through a cylinder of $+ 1.5$ D.

With the axis of the cylinder horizontal, i. e., one hundred and eighty degrees, the letters "O" 6/60, 6/36 and 6/24 show blurring above and below. The letter 6/18 suggests doubling, the letters 6/12 and 6/9 are doubled, the letters 6/6, 6/5.5 and 6/4 are well doubled, the letter 6/3 is trebled, and the letter 6/2 is still further multiplied. All these letters are multiplied in the vertical direction.

When the axis of the cylinder is vertical (ninety degrees) the result is as follows: There is a suggestion of lateral doubling in the letter 6/18. The letters 6/9 and 6/6 are doubled, and the smaller letters appear as multiple images.

It was found that this doubling or polyopia could be produced in this way with lenses of varying strength and size, but the best results were obtained by lenses of 1 D. to 3 D.

A point of light or a fine black point on a white paper could not be doubled with any device. No satisfactory explanation was found as to why this was so when an "O" or a "T" was at once doubled by a cylinder.

A camera made artificially astigmatic was employed to eliminate psychic doubling. The results were not as definite as those seen subjectively, but sufficiently definite to show that the doubling or trebling is produced by purely objective means.

A case of Dr. A. W. Orr's is reported, in which with the left eye there was a doubling of the "E" corresponding to 6/60 of Snellen's types. The image was upward and to the left at an angle of forty-five degrees. There was less marked doubling with the right eye, and the image was more directly above and a trifle to the right. With both eyes open the

doubling was scarcely noticed. After dilatation of the pupils the doubling was more noticeable, and was slightly to the left above with both eyes open. On correcting his refraction the result was found to be as follows:

$$\begin{array}{lcl} \text{R. V. c.} & \frac{-.5 \text{ D sph.}}{-2.25 \text{ D, cyl. } 175^\circ} & 6/4 \\ \text{L. V. c.} & \frac{-.5 \text{ D sph.}}{-1.75 \text{ cyl. } 145^\circ} & 6/4 \end{array}$$

Even with the correction, slight doubling was still experienced with the left eye, which, however, disappeared on the use of a diaphragm of two millimeters diameter.

W. R. P.

Some Emergencies in Ocular Therapeutics.

DARIER, A. (*Ophthalmoscope*, August, 1914). The advance in ocular therapeutics during the last decade is briefly reviewed, with mention of the various lines of research now being worked on.

The collateral or paraspecific action of medicaments is of importance. Serum therapy, in addition to its specific action, exercises a marked influence upon lymphocytosis, polynucleosis, phagocytosis, etc. It is of the utmost importance to interfere as early as possible in all infective diseases, and here paraspecific serotherapy renders much service by an active stimulation of the general defenses of the organism while awaiting the specific antitoxins and bacteriolysins indicated by an ulterior bacteriologic report.

Tuberculin exerts a very much more favorable action in ocular tuberculosis than in the pulmonary form. In conclusion, the author suggests that the Congress should take the initiative in making a thorough inquiry into the subject of tuberculin. The following questions were suggested:

First.—Do you approve, and if so, why, of treatment by tuberculin?

Second.—How many cases have you treated, and with what results?

Third.—Have you observed any bad results from too pronounced a reaction?

Fourth.—What tuberculins or what antituberculous sera have you used, and in what doses? Have you a leaning towards any particular product?

Fifth.—Have you used conjointly with the serum any other therapeutic agents, and, if so, which?

Sixth.—What about relapses, and the duration of treatment?

Seventh.—What is your percentage of cures in each category of ocular diseases?

W. R. P.

Delayed Healing in Cataract Extraction.

VAIL, DERRICK T. (*Ophthalmoscope*, August, 1914). The well known causes of delayed healing in cataract extraction are cited in both conjunctival flap incision and in limbus or purely corneal sections.

The anterior chamber, however, does reform, and often promptly, when the wound is forced apart with iris hernia, vitreous hernia, lens masses, shreds of tissue, and also when spastic entropion exists; and this has led to the search for another cause for delayed closure of the wound and prolonged evacuation of the aqueous chamber.

The author believes that the real cause is an involuntary spastic contraction of the orbicularis palpebrarum muscle, or a localized convulsive "tic" affecting this muscle, which by its alternate contraction and relaxation presses the convexity of the cornea, thus flattening it to a certain extent, and causing the aqueous to spurt through the wound in little gushes.

The forces at work to cause this delay in healing, in brief, are: First, absolute minus tension, due to the nature of the operation and possibly local shock following it. Second, recumbent position, permitting the weight of the eyelids to fall sheer on the collapsed cornea. Third, involuntary winking, twitching movements to disturb union. Fourth, distinct spastic fibrillary and cramp-like contraction of the orbicularis palpebrarum muscle. And, aided by, fifth, too frequent and meddlesome inspection.

As a remedy of these conditions the following operation has been devised: A drop or two of sterile cocain, four per cent solution, is injected upward and downward into the tissue above and below the external canthal ligament. A strong pair of sharp-edged, blunt-pointed scissors are used to sever the orbicular muscle from its attachment, not outward in line with the palpebral fissure, but at right angles to it, viz., directly upwards and downwards. The bleeding is insignificant.

Three cases of delayed healing, the relevant data of which are given, were promptly cured by this method.

In conclusion the writer suggests that if after ten days' waiting scrutiny with a loupe shows evidence of aqueous escaping, this operation be performed. To those operating with conjunctival flap (Vail does not) evidence of a cystoid scar beginning to form is an indication also for the performance of this operation.

W. R. P.

The Results of Modern Glaucoma Operations.

EVANS, J. JAMESON, AND BUTLER, T. HARRISON (*Ophthalmoscope*, August, 1914). The results are given of one hundred and sixty cases of glaucoma operated upon quite independently in three institutions by the two surgeons. About one case in five hundred patients came to operation for glaucoma. The fields were carefully studied and the Schiötz tonometer used to measure the tension.

Following is the tabulated summary of cases operated:

STATISTICS OF OPERATIONS FOR GLAUCOMA.

ACUTE AND SUBACUTE GLAUCOMA.

Operation.	No. of cases.	Vision improved or preserved.	Tension reduced to normal.
Scleral operations...	42	32 = 76 per cent.	35 = 82 per cent.
Iridectomies	28	26 = 71 per cent.	23 = 88 per cent.
	70	52 = 74 per cent.	58 = 83 per cent.

CHRONIC GLAUCOMA.

Iridectomies	30	25 = 83 per cent.	21 = 70 per cent.
Trephine	23	17 = 74 per cent.	20 = 87 per cent.
Herbert's wedge....	15	11 = 73 per cent.	12 = 80 per cent.
Holth's punch.....	18	13 = 72 per cent.	14 = 77 per cent.
Small flap.....	5	2 = 40 per cent.	2 = 40 per cent.
	91	68 = 75 per cent.	69 = 75 per cent.

ALL GLAUCOMAS.

Total.....	161	120 = 74 per cent.	127 = 78 per cent.
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The most striking discovery made was that iridectomy headed the list of visual results in chronic glaucoma.

The high position occupied in the tables by the wedge operation is probably largely due to the basal iridectomy. In cases in

which the aperture made by punch or trephine has completely healed up, the presence of a basal or complete iridectomy has made the operation a success. Similar cases in which no iridectomy was performed have shown signs of recurrent glaucoma as soon as filtration ceased.

These facts lead us to the conclusion that an iridectomy should always be added to the sclerectomy.

The second fact noted is the general success of all the operations. It would appear that the disease was arrested in sixty per cent of the cases submitted to operation.

The results obtained in chronic glaucoma compare very favorably with those in the acute and subacute variety.

The small flap operation of Herbert was abandoned after a few trials; the incisions were found to heal perfectly with no filtration resulting.

The statistics show that the effect of the wedge isolation method (Herbert), of trephining (Fergus-Elliot), and of Holth's punch operation is practically equal.

In acute glaucoma, with a reasonable depth of anterior chamber, iridectomy seems still to be as satisfactory as any other method. It is perhaps the most satisfactory operation.

Very little quiet iritis was experienced after the scleral operation. It was not more frequent than after iridectomy, and when iridectomy accompanies the sclerectomy, iritis gives no trouble.

W. R. P.

An Improvement in Local Anesthesia in Operations Upon the Eye.

POOLEY, G. H. (*Ophthalmoscope*, August, 1914). Local anesthesia of the eye is obtained by injections of alypin along the course of the long and short ciliary nerves behind the eyeball. A straight needle is introduced into the region at the back of the posterior pole of the eyeball, either from the skin or the conjunctival fornix, either above or below the external rectus muscle.

The technic is as follows: The conjunctival sac should be prepared and washed out in the manner usually employed before an intraocular operation, and the skin at the outer canthus painted with spirits of iodin, if the skin route is preferred. If time is not of importance, a five or ten per cent solution of cocain should have been instilled into the conjunctival sac at intervals of thirty, twenty and ten minutes

before operation; if time is of importance, a crystal of solid cocain may be placed on the fold of conjunctiva which is to be injected first. A hypodermic syringe with a graduated barrel, so that the amount of fluid injected can be measured, and a stout steel needle, with a specially sharpened point and a sterilized solution of alypin, are required.

A fold of conjunctiva is picked up with fixation forceps on the outer side of the eyeball, half way between the fornix and the corneal margin, the needle jammed sharply through the conjunctiva and three or four minims of the fluid injected, the point of the needle being directed towards the fornix. The needle is then withdrawn and the patient asked to look in the opposite direction which is being operated on (that is, to the right for the left eye, and to the left for the right eye) and the eyeball fixed with fixation forceps. The point of the needle is then brought in contact with the conjunctiva at the fornix, just above or below the external rectus muscle, and introduced with a short sharp stab through the conjunctiva and Tenon's capsule; a few minims of solution are then injected, and the point pushed on in the direction of the posterior pole of the eyeball and fifteen to sixty minims injected; the needle is then removed. The patient feels the sharp prick of the needle, but no marked discomfort.

The following solution is used, fifteen to thirty minims in noninflammatory cases, and thirty to sixty minims in inflammatory cases. Even more may be used in larger operations such as evisceration:

Alypin	gr. xv $\frac{1}{3}$
Sod. chlor	gr. xii
Sol. adren. chlor. (1/1000).....	m. x
Aq.	ad. oz. iiiss

The author has employed this method with practically complete anaesthesia in the following cases:

Sclerostomy	13
Cataract	13
Evisceration	7
Iridectomy	9
Steel removed by magnet.....	3
Division of synechiae.....	2
Total.....	47

W. R. P.

The Present Status of the Heterophoria Question.

REBER, WENDELL (*Ophthalmoscope*, August, 1914), has contributed a valuable monograph on heterophoria in its various phases.

The anatomic phase deals chiefly with the study of the insertions of the tendons of the ocular muscles, and the lack of uniformity in the insertions in different eyes.

In ten eyes examined the greatest variations were found in the distance from the cornea of the muscular insertions. Interesting variations were also found in the breadth of the tendinous insertions.

Attention is called to the manner in which the external layer of the capsule of Tenon reaches forward with the fanned-out tendinous expansion of the four recti muscles to form what is practically a flat ring of fascia (or fascial collar) lying on the globe about six and one-half millimeters from the cornea. This has its relation to the result obtained in tenotomy, if division of the tendinous expansion is done just at the insertion, in which case the secondary insertional fibers still preserve almost the full action of the muscle. This fascial collar probably has much to do with compensating in some fashion for the variations in the primary insertion of the tendons, for if the variations in the breadth and distance of the insertions as above noted prevail generally, there would be much greater disturbance of muscular equilibrium than there is. Certain fibers of the capsule are condensed into the check ligaments which reach from the anterior portion of the capsule toward the orbital margins, especially in the lateral meridian.

The method by which the visual apparatus so utilizes the two eyes as to resolve them into the single or cyclopean eye has been a ground of perpetual controversy. The innervations of the eyes (conjugate, as they are termed) preside over their balance in all those who enjoy stereoscopic single vision. These innervations have been variously estimated. Five conjugate innervations have long been known, namely:

1. Binocular elevation.
2. Binocular depression.
3. Binocular right rotation.
4. Binocular left rotation.
5. Binocular convergence; a distinct act.

There are probably a number of others, but they remain at present speculative.

The most attractive and complete scheme, from a speculative standpoint, is that offered by Maddox, of twelve binocular innervations divided into two kingdoms:

1. For creating the binocular eye.
2. For directing the binocular eye.

Thorough refraction under atropin with the wearing of a full correction of the refraction estimate, does not always bring about normal relations between accommodation and convergence, because of three potent factors—namely:

1. That certain individuals reveal insufficiency either in their relative accommodation or relative convergence.

2. That nature establishes for every one with stereoscopic (binocular) vision—be he emmetropic or ametropic—some manner of working relation between his accommodation and convergence, which with years of habit as its basis will not tolerate too gross a disturbance.

3. Anatomic anomalies in the insertions of the muscles or relative power of the muscles often produce a train of symptoms that refuse to yield to the correction of the refraction only.

A review of one thousand refractive and muscular cases of the writer's private practice indicates that about seventy per cent of them were relieved of their symptoms by the use of their refractive correction alone. The remaining thirty per cent required some manner of attention to their oculo-muscular status to bring about more or less complete relief.

General health bears the same relation to heterophoria that it does to any and every deviation from the normal in the various parts of the body. Not all muscular imbalance will prove amenable to better life habits and health, but will require correction before the general health can be anywhere near restored.

The occupation aspect of heterophoria is important. The work performed by the eyes in the commercial and industrial world has increased probably one hundred fold during the last hundred years. Living conditions have correspondingly improved, but even as it is, a terrific strain is imposed upon both accommodation and convergence in every-day life.

A young farmer, or a laborer of any kind, may be the sub-

ject of two to three diopters of hypermetropia and experience as little discomfort with it as a soldier with one or two degrees of hyperphoria.

Let either of these engage in an occupation requiring steady use of the eyes at twenty-five centimeters, and it would not be long before urgent symptoms would compel a visit to the ophthalmic surgeon.

Occupation thus takes a prominent place as one of the factors in the production of muscular asthenopia.

The influence of age in the development or appearance of heterophoria is also a weighty one. Analysis of one hundred consecutive cases of esophoria showed the greatest number to follow the third decade of life. In four hundred and forty-one cases of exophoria, thirty to fifty years of age showed the greatest manifestation. The age incidence in hyperphoria in one hundred and fifty cases was mainly between the thirtieth and sixtieth years of life.

The influence of heredity upon muscular imbalance was studied in seven families, composing fifty-six members, of which forty were personally examined. One was orthophoric, five were esophoric, and thirty-four of the forty were exophoric. Three families were also studied in which there were a number of hyperphorics. The writer believes that there are certain hereditary influences at work in many of our cases that have not been sufficiently worked out.

(To be concluded.)

W. R. P.

Eye Lesions Resulting From "Autointoxication."

THOMPSON, H. M. (*The Journal of Ophthalmology and Oto-Laryngology*, Vol. VIII, No. 7, July, 1914), discusses autointoxication, repeating various definitions of the term, and going into symptomatology. He gives a brief outline of Elschnig's findings in a study of sympathetic ophthalmia. Elschnig gave a report of thirty-eight cases of iridocyclitis, twenty-nine of which showed no definite etiologic factor except autointoxication. Disturbance in the intestinal tract was proved in twenty-four of these cases.

Dr. Thompson then reports three cases from his practice illustrating the effect of autointoxication on the eye.

Case 1 is one of recurrent uveitis showing a negative Wassermann, indicanuria, chronic constipation and positive von

Pirquet. On general examination tenderness was discovered over the ileum and sigmoid flexure. Exploratory incision showed large adherent appendix and a tubercular peritoneum. After the operation the patient improved rapidly and has had no recurrence.

Case 2 is one of recurrent iritis giving history of chronic constipation, and urine showing marked indicanuria and slight albuminuria. General examination revealed slight tenderness over McBurney's point. After appendectomy the patient recovered completely and has had no recurrence.

Case 3 was one of uveitis with extensive vitreous opacities. Patient was poorly nourished and subject to chronic constipation.

In one year of careful treatment eye cleared, giving vision of 20/40, but on relaxing her general care she notices a change for the worse. This patient has a good sized fibroid, which Dr. Thompson thinks is responsible for her trouble.

Dr. Thompson believes that scleritis, keratitis and ulceration of the cornea are frequently due to absorption of toxins from the intestinal tract. E. C. E.

Giant Cell Sarcoma of Orbit.

FRIEDENWALD, HARRY (*The American Journal of Ophthalmology*, Vol. XXXI, No. 6), states that cases of this form of sarcoma are rare, and cites a case reported in 1905 by Fleming and Parsons. These gentlemen stated, at the time they reported the case, that they could find no previous record of such a case. The case reported by Dr. Friedenwald showed a large firm growth adherent to the right upper lid and extending back into the orbit. It was diagnosed as a malignant growth of the lacrimal gland. On operating, the growth was found adherent to the periosteum of the orbital roof and to the tarsus. The lacrimal gland was not involved. About one-half of the lid margin was lost, but this defect was repaired.

The tumor proved to be a giant cell sarcoma, originating in the orbital periosteum.

In May, 1914, nearly five years after the operation, the patient was still in good health, has had no recurrence of the growth, and the vision of the right eye is as good as that of the left. E. C. E.

Some Notes on a Family With Hereditary Congenital Cataract.

DANFORTH, C. H. (*The American Journal of Ophthalmology*, Vol. XXXI, No. 6), gives a chart showing four generations of a family in which nine members in three generations had congenital cataracts. The cataracts approach the lamellar form more than any other. He suggests that since lamellar cataracts are frequently sporadic and sometimes clearly hereditary, it is possible there are two kinds of lamellar cataracts.

Two other peculiarities noticed in this family are an occasional slight mental retardation and nystagmus. Danforth discusses the question of the relation of mental defects to cataracts in this family, and comes to the conclusion that there is no relation between the mental retardation and the cataracts. In regard to the nystagmus, he cites Loeb and Nettleship as authorities for the fact that nystagmus may be inherited as an independent entity. He thinks that the nystagmus is, in part at least, clearly hereditary. E. C. E.

Removal of Globe After Sclerocorneal Trephining.

GREEN, JOHN, JR., AND HARDY, WM. F. (*The American Journal of Ophthalmology*, August, 1914), report a case of chronic glaucoma in a woman aged fifty-nine years, in which the eye was trephined, according to Col. Elliot's method, for an attack of acute glaucoma. The only difficulty encountered was due to the dullness of the trephine. Iridectomy was performed. There was hemorrhage into the anterior chamber, and the tension was higher after the operation than before, leading the operator to suspect a deep hemorrhage. The recovery was tedious, and the eye painful for several days. A month after the operation it was noticed that the lens was becoming opaque, the tension was normal and later the eye showed symptoms of an impending panophthalmitis. The globe was then enucleated. The microscopic findings showed the iris prolapsed into the trephine opening, iris pressed against the cornea, the capsule of the lens ruptured at its superior aspect, the vitreous filled with a grumous mass, purulent and bloody in character, and the trephine opening filled with connective tissue, round cell exudate, blood, iris pigment, and epithelium. E. C. E.

A Case of Supernumerary Eyelid.

SHOEMAKER, J. F., AND ALT, A. (*The American Journal of Ophthalmology*, Vol. XXXI, No. 8, August, 1914), report a case of supernumerary eyelid removed by them. The growth was situated at the inner canthus of the left eye in the region of the caruncle, and protruding between the lids. The growth was easily removed, and the examination by Dr. Alt showed it to be made up of all the elements found in the caruncle and lid.

E. C. E.

Enucleation With Transplantation of Fat Into the Orbit.

STIEREN, EDWARD (*Jour. Am. Med. Assn.*, August 15, 1914), has modified the original technic of Barraquer because with it he noticed frequently a shrinkage of the cushion from absorption of the fat. After dividing the conjunctiva at the limbus, a double-armed suture of twenty-day catgut is passed through each of the recti near its insertion, and then through the edge of the conjunctiva. The eye is then removed as usual and the socket left in the care of an assistant. Then a piece of fat about the size of the eye is removed from the abdominal wall near the median line. This piece of fat, which should include the subcutaneous tissue, is then introduced into the orbit with the subcutaneous tissue upward, the sutures are tied, and a purse string suture is put into the conjunctiva and tied. The prothesis may be worn as soon as the sutures are absorbed. The absorption of fat varies from a quarter to a third of its bulk. The success of this operation has been most gratifying.

E. C. E.

The Etiology of Phlyctenular Ophthalmia—Is Tuberculosis Really as Important a Factor in the Causation of This Disease as Is Now Commonly Taught?

THEOBALD, SAMUEL (*Jour. Am. Med. Assn.*, August 15, 1914). In recent years the theory that phlyctenular ophthalmia is a tuberculous manifestation has been supported by many eminent ophthalmologists.

In support of this belief they cite:

1. The frequency (seventy to ninety per cent) with which the subjects of phlyctenulosis give a positive reaction to tuberculin.

2. The efficacy of tuberculin in the treatment of phlyctenulosis.

3. The development of phlyctenular conjunctivitis and keratitis after the application of tuberculin to the eye, and after other diagnostic tuberculin tests.

4. The occasional occurrence in phlyctenular ophthalmia of focal reaction after the use of tuberculin.

5. The chronicity and tendency to recurrence of the disease, and its predilection for those whom tuberculosis most readily attacks.

Theobald mentions the fact that the tubercle bacilli are never found in the phlyctenules, and then takes each of the above arguments in turn and answers it as follows:

1. Hamberger and others have shown that about the same percentage of positive reactions to the von Pirquet has been encountered in healthy persons as has been found in those suffering from phlyctenulosis.

2. A review of a paper read by Dr. Richard J. Tivnen on the use of tuberculin in the treatment of phlyctenulosis leads Theobald to believe that the tuberculin used in this series of cases was a definite handicap to the other therapeutic measures employed. Theobald also reviews a paper by Davis and Vaughan which shows even less favorable results than those of Tivnen. He accounts for this by the fact that they used no other constitutional treatment than tuberculin, and no local treatment except atropin in two cases, while Tivnen used tonics and the usual ocular treatment.

3. Hamman and Wolman are quoted as saying that "in several thousand instillations of tuberculin we have had but two untoward results, one patient developing phlyctenular conjunctivitis, which subsequently completely healed; the other, an episcleritis, which also healed, and which we are not sure was due to the test." He says that the development of phlyctenules after skin or subcutaneous tests is very rare. He believes that any irritant other than tuberculin put into the eye would cause as great percentage of phlyctenulosis.

4. The definite focal reactions noticed in the two series of cases mentioned above were 3.33 per cent of the whole number. Theobald thinks that any constitutional disturbance comparable to that produced by the von Pirquet test would

have influenced unfavorably the ocular inflammation quite as often and quite as markedly as happened in these cases after the tuberculin test.

5. He admits that there are cases in which the "scrofulous diathesis," the glandular complications, and, not infrequently, definite clinical signs of tuberculosis, are found. On the other hand, he asserts that a much larger number of the cases encountered in childhood do not show these signs.

In conclusion, he says: "As phlyctenulosis is essentially a disease of childhood, and the typical cases occur not in adult life, but in children, it is from the study of these cases that trustworthy conclusions as to the etiology of the affections are to be drawn. The study of these childhood cases shows, from the almost constant association of facial eczema with the ocular inflammation, that phlyctenular ophthalmia, as was formerly very generally held, is an ocular eczema, due, for the most part, like the facial eczema, to intestinal intoxication, and that tuberculosis is seldom, if ever, an etiologic factor."

E. C. E.

Convergence Insufficiency.

DUANE, ALEXANDER (*Jour. Am. Med. Assn.*, August 24, 1914). Convergence insufficiency is probably present in eight per cent of our eye patients, though it by no means causes symptoms in all of them.

A case of convergence insufficiency presents the following features:

1. Deviation for distance little or none.
2. Prism divergence (abduction) not excessive.
3. Prism convergence (adduction) subnormal and difficult.
4. Exophoria for near points marked and increasing with approximation of the test object.
5. Convergence near point abnormally remote.
6. Lateral movements of each eye inward and outward normal in extent and comitant.
7. Diplopia, if present, not increasing to right or left.
8. Convergence reaction of pupil deficient or absent.

It must be differentiated from divergence excess, and from insufficiency of an adductor. Differentiation from divergence excess follows:

CONVERGENCE INSUFFICIENCY.

DIVERGENCE EXCESS.

Exophoria for distance slight.	Exophoria for distance marked.
Exophoria for near marked.	
Prism divergence not excessive.	Exophoria for near moderate; may be almost nil.
Prism convergence deficient and difficult to increase by exercise.	Prism divergence excessive.
Convergence near point remote.	Prism convergence normal or readily brought to normal.
Crossed diplopia, if present, marked for near points and increasing as object is brought toward eyes.	Convergence near point normal.
	Crossed diplopia, if present, marked for distance. Usually none for near.

From insufficiency of an adductor, convergence insufficiency is differentiated by the fact that in the former condition either the power of movement of the affected eye inward is obviously impaired, or at all events the exophoria and the crossed diplopia, if present, increase definitely as the eyes are carried to one side or the other.

Instead of a pure convergence insufficiency, there may exist other accompanying conditions which complicate the diagnosis, such as:

1. Convergence insufficiency with divergence excess.
2. Convergence insufficiency with secondary weakness of interni.
3. Convergence insufficiency with insufficiency of the elevators and depressors.
4. Convergence insufficiency with divergence insufficiency.
5. Anomalous cases.

Convergence insufficiency may be primary or secondary. The primary form may be either accommodative or unaccommodative—i. e., it may be associated with and due to insufficient accommodation, or it may be independent of any anomaly of the refraction or accommodation. This latter type may be due to neurasthenia or other functional nervous disturbances, to nasal disease, or to some unknown factor. The two forms of primary convergence insufficiency may be combined. Secondary convergence insufficiency often develops when a divergence excess has lasted for a long time.

Convergence insufficiency and convergence paresis are so closely related that a sharp dividing line does not exist. Convergence paresis is usually due to a localized lesion or functional disturbance of the nerve centers, and is marked by the following features:

1. In the far distance (twenty to fifty feet), little or no deviation.

2. The moment an attempt at convergence is made, exophoria and crossed diplopia set in and increase *pari passu* as the object is approximated.

3. The diplopia once evident is almost or quite insuperable.

4. No attempt is made at convergence.

5. The lateral movements of the eyes are unaffected, each eye as it moves with its fellow to right or left rotating quite normally inward. In other words, we are not dealing with any paresis of the *interni per se*.

6. The convergence reaction of the pupil is usually absent.

Convergence paresis is rather rare.

Accommodation convergence insufficiency tends to increase, since it is an insufficiency from disuse. If long maintained, or if it progresses to a considerable point, it is apt to be followed by a divergence excess—i. e., divergent squint.

The course of the nonaccommodative convergence insufficiency may be said to depend on the cause.

The symptoms of convergence insufficiency are: Diplopia, asthenopia, eyeache, headache, and sometimes more reflex symptoms. The diplopia is rarely a spontaneous complaint, but can usually be elicited. Asthenopia is a common symptom.

The treatment is along the following lines:

1. Correction of the refraction.

2. Correction of existing causes other than refraction.

3. Practice in converging on an approximating point, and with prisms base out.

4. Practice with the amblyoscope, stereoscope and bar reading.

5. Practice in recognition of diplopia with the aid of the red glass.

6. Prisms for constant wear.

7. Operation.

The use of prisms (base in) for constant wear is condemned.

E. C. E.

International Standard for Testing Vision and Standardizing Other Visual Tests.

JACKSON, EDWARD (*Jour. Am. Med. Assn.*, August, 29, 1914), makes a plea for the use of the international standard test for visual acuity. While the ordinary test letters are satisfactory for the determination of errors of refraction, as scientific standards he classes them with the old standards for length—"three full grains of barleycorn taken from the middle of the ear," or "the distance a man can walk between sunrise and sunset." The two chief defects of the test letters are that the different letters are visible from different distances, and that they may be committed to memory.

The international standard test is a broken ring, and the break may be turned in any direction by turning the card, thus making the test impossible to memorize.

Our old test letters may be standardized by numbering each line by its equivalent value as compared with the international standard. If this is done, our test letters may be used as a practical test of visual acuity, and records made from these tests will be accurate.

E. C. E.

Epithelioma of the Lids.

FISHER, CARL (*Jour. Am. Med. Assn.*, August 29, 1914), gives an analysis of eighty-eight cases of epithelioma primary in the lids and canthi, or invading them from the immediate vicinity. All these epitheliomas belonged to the basal celled type. In the series, the average age of incidence was fifty-three, and the average patient waited five years before coming for treatment. Five of the cases had glandular involvement, and four of these cases had had previous unsuccessful treatment, leading one to believe that unsuccessful treatment favors glandular involvement.

The methods of treatment were three—radical excision, excision with cautery of the wound, and cautery—the method employed depending on the site and extent of the growth.

Of thirty-three epitheliomas involving the lids and canthi, not including the orbit, ninety-four per cent were cured. When the orbit was involved, twenty per cent were cured.

The factors found to mitigate against cure are: Inner canthus involvement, penetration of the conjunctiva or lacrimal sac, orbital involvement, and sinus involvement.

Fisher finds his percentage of cures greater than that of those who have depended on radium, Roentgen ray or pastes.

E. C. E.

Modern Treatment of Lacrimal Obstruction.

DAVIES, D. L. (*Lancet*, January 3, 1914). The large number of lacrimal sacs that are now excised annually bears eloquent testimony to the unsatisfactory results from probing. Undoubtedly probing does at times meet with brilliant success, but such cases cannot be frequent, else why this wholesale excision of sacs? The reasons for the failure of the various probing methods are numerous. Amongst them is the tendency for the stricture to close, necessitating repassing of probes at intervals for years, or at any rate until the patient gets tired of the treatment.

The use of styles following probing has had a good many advocates. They do not always relieve; in many cases they are a source of discomfort, and in not a few cases have patients presented themselves at the hospital with marked cellulitis of the tissues round the orbit, due to a forgotten style, which in some cases had been there for years and was extracted with difficulty.

In favor of extirpation of the sac is the fact that it shortens treatment; it is an effectual preventive of those suppurative affections of the sac which frequently follows stricture. It is, however, a mutilation, and from that point of view an unsurgical procedure in the highest sense of the term. But in saying this I do not deny that many cases are best treated by extirpation of the sac; among such one would mention tuberculous disease of the sac or those in which a bad fistula was present in patients advancing in age. Against it also has been urged the statement that infectious conditions of the conjunctiva are more frequent, more difficult to cure, and more liable to relapses after removal of the sac.

The ideal treatment is, of course, to restore as far as possible the natural drainage of the sac. The best means by which this can be done at the present time appears to be the method elaborated by Toti, or, to give it its rather cumbersome name, dacryocystorhinostomy. This is a genuine attempt to meet the surgical requirements, though probably the future will see further improvements on these lines.

For the past two and a half years I have been doing Toti's

operation on selected cases, and have now actually done ten. Of these ten cases, seven have been and are, so far as I can trace them, completely cured of their epiphora. Two patients were only partially relieved—that is to say, they still complained of watering of the eye when I last saw them, though it was possible, but with difficulty, to syringe fluid through into the nose.

Against this operation may be urged:

1. That it is difficult to perform.
2. A second objection urged against the operation is the danger of infection of the conjunctiva from the nose.
3. Again, it has been urged that there would probably be a good deal of discomfort during the process of blowing the nose, from the fact that there is such a free communication between the lacrimal sac and nasal cavity.

N. M. B.

An Operation to Improve the Effect of an Artificial Eye.

HARMAN, N. B. (*Lancet*, February, 1914). Other things being equal, such as the presence or absence of scarring due to the condition that necessitated the removal of the eye, the controlling factor in the effectiveness of the disguise is the shape and size of the palpebral fissure. When the fissure is small the disguise is usually effective, so much so that many wearing glass eyes pass unremarked even by careful observers. When the palpebral fissure is wide and generous in its proportions the glass eye becomes the most marked feature of the face, and there is no escape from the fixed stare of its artificiality. In such cases the insufficiency of the supporting shell is commonly marked by a definite space between the shell and the external canthus, and always by a deep hollow beneath the eyebrow, and a lesser furrow in the lower lid, all due to the falling away of the lids from their insufficient support.

The operation is designed so to alter the palpebral fissure as to give the naturally "large eyed" subject the benefit of the "small eyed" when a false eye has to be worn. The operation is in brief tarsorrhaphy. Both lids are split for a sufficient distance about the external canthus, and the raw surfaces of the skin flaps are sewn together and allowed to unite. The union produces a narrowing of the palpebral fissure, and an effective disguising of the artificial eye.

The operation is described in detail, as is also the author's forceps for external tarsorrhaphy.

N. M. B.

Errors of Refraction in School Children.

PERCIVAL, A. S. (*Lancet*, February 14, 1914), advises dividing children into two classes, literates and illiterates, and insists on having a report from the teachers of all children who seem to have a difficulty in seeing, (D); headache troubles, (H), etc., and a further note if they are illiterate, (Il.).

First examine external eye by oblique light. If external defects are found, pupil should be referred to medical man for treatment.

Second, test vision with test charts, and do not call 6/6 vision normal vision, but standard vision.

Third, if test card vision is below standard vision, repeat the test with the pin hole diaphragm. This is the diagnostic test of an error of refraction.

Myopia.—In slight cases, those about 2 D. or less, order the appropriate glasses to enable them to see the blackboard at school, but inform the parents that if there is no further increase of the myopia there will be no necessity for them to wear glasses when they grow up if their work is close, but that they will always require glasses for seeing at a distance.

In more advanced cases of myopia there is a great tendency for it to increase, so special instructions must be given to the parents and to their teachers. The eyes must not be rotated downwards. The work must be raised nearly to the level of the eyes, the head being slightly inclined, and held as far off as convenient—at least twelve inches. Books should be placed on a suitable book rest, or upon a high sloping desk, on which all writing should be done. The illumination should come over the left shoulder, so that the letters as they are written may be distinctly seen, and not fall in the shadow cast by writing hand.

Hypermetropia.—Should the spectacles be worn constantly or only for near work? In the absence of squint, and when the vision is 6/6, without any symptoms of headache or eye-strain when viewing objects at a distance, do not insist on the glasses being worn constantly. With an error of + 3 D. or more, they should be ordered to be worn at school and for all close work. But if the error be only about + 1 D. or + 1.5 D., do not order them. What is the use of ordering + 1 D. glasses to children who have about fifteen diopters of accom-

modation to compensate for such slight errors? However, remember that in a case of internal squint the correction, if over $+ 1.5$ D., must be worn constantly.

Astigmatism.—The whole of the astigmatism found by retinoscopy under homatropin should be corrected by appropriate cylinders, and if there are any symptoms whatever, whether defect of sight or headache or eye strain, they should be worn constantly.

Anisometropia is subdivided into two varieties:

1. Those who have binocular vision.
2. Those who have not binocular vision: (a) Those who use their eyes alternately. (b) Those who only use one eye, the other being amblyopic.

1. In this class, where binocular vision is present, the difference of refraction will usually be small, and the full correction should be given to each eye, even if the difference should turn out to be as much as $+ 4$ D.

2. (a) Theoretically, of course, the correction should be given to each eye, and stereoscopic exercises enjoined, so that he may obtain binocular vision. (b) Every effort must be made to regain the sight in an amblyopic eye, and the younger the eye the speedier will be the recovery of its sight. The full correction for each eye should be worn constantly; and at meal times the better eye should be covered by a piece of paper or card to force the child to eat his meals with the feeble sight of his amblyopic eye. It is important that the exercise should not be too exhausting to the eye, and that it should be regular, frequent, and not too long continued.

N. M. B.

The Technic of the Operation for Sclerocorneal Trephining for Glaucoma.

ELLIOT, R. H. (*Lancet*, March 21, 1914). When the writer left India the Madras figures showed over nine hundred trephinations, and the number of surgeons who had learnt to practice this operation there could be counted by tens. Since then he has had the opportunity of trephining one hundred and thirty-five eyes in the course of a tour in America, and of performing the same operation on a number of cases in England. In both countries he has had the great advantage of receiving very valuable suggestions from those who attended his dem-

onstrations. The object of this paper is to place the experience so gained at the disposal of others.

The article should be read in its entirety, as it is impossible to cover it in an abstract.

The essential points mentioned are:

1. In which quadrant of the eye should the trephining be performed?
2. The nature of the flap and method of making it. Under this heading is discussed:
 - (a) The dissection of the flap.
 - (b) The splitting of the cornea.
3. The application of the trephine.
4. The iridectomy: its nature and the method of performing it.
5. The toilette of the wound.
6. Instillation of drops.

N. M. B.

Notes on Diabetic Retinitis.

WEST, S. (*Lancet*, April 11, 1914). I have seen many cases of retinitis in diabetes, and I may say at once that I have failed to observe anything whatever characteristic in it—that is to say, anything by which from the change in the retina diabetes could be diagnosed as granular kidney can.

I agree, too, with the statement that many cases of so-called diabetic retinitis are typically albuminuric, and are due to the association of diabetes with granular kidney, an association which is by no means rare. But this does not exhaust the subject.

There are two forms of albuminuric retinitis, which I have called the degenerative and the exudative respectively.

The degenerative form is the familiar and well-recognized type characterized by the white glistening patches of degeneration of varying sizes, and grouped especially round about the yellow spot, but whether large or small, equally characteristic and quite pathognomonic, for they occur with no other disease.

In the exudative form there is exudation involving the disc and extending from the disc outwards in any direction; the patches of exudation may be of larger or smaller size, but if small, never present the bright glistening appearance charac-

teristic of the other form, but are of a dull yellowish color, and a woolly or fluffy character, with no sharply defined margins. There is nothing in this form to distinguish it from the neuroretinitis of other affections—e. g., that which occurs with cerebral tumor. This form may occur in acute nephritis as well as chronic. It may disappear entirely as the nephritis recovers, while the degenerative patches are persistent and practically never disappear, probably because the renal lesions are permanent.

The exudative form is in all cases, I believe, of toxic origin, and might therefore arise in the course of diabetes, just as it does in the course of acute nephritis.

The view I am expressing would reconcile and explain the different opinions held. The degenerative form would be characteristic of granular kidney, whether associated with diabetes or not. The exudative form would be of toxic origin and indistinguishable from that which is seen in other toxic states, and be due to some poison produced in diabetes which attacks the optic nerve and retina, just as it sometimes does the peripheral nerves. What the poison is we know no more in diabetes than we do in nephritis.

N. M. B.

The Use of Omnopon-Scopolamin Combined With Local Anesthesia in Ophthalmic Surgery.

RAMSAY, A. M. (*Lancet*, April 25, 1914). Omnopon forms a light brown powder, five times the strength of opium, and contains the alkaloids in the same proportion as in the crude drug. It is usually prescribed as a two per cent aqueous solution to which twenty-five per cent of glycerin is added as a preservative. It may be given by the mouth, but in most instances it is more convenient to administer it by hypodermic injection. It is supplied for that purpose in sterile ampoules, each containing 1 cc. of the two per cent aqueous solution of the drug. It was soon discovered that the good qualities of omnopon were greatly enhanced by combining it with scopolamin, and omnopon-scopolamin is now preferred by many to the better known morphin-scopolamin preparation. The average dose for an adult is two-thirds grain of omnopon and 1/150 grain scopolamin.

It is true that since the introduction of cocain, chloroform

and ether are used much less frequently in operations upon the eye. The use of cocain by itself, however, does little to allay a patient's nervousness and restlessness. Local anesthesia may be perfect, but the mind of the patient is not at ease. He is alert and apprehensive, and in consequence has difficulty in keeping himself under proper control. The use of omnopon, however, acts as a sedative to the brain, makes the patient feel calm and self-possessed, and thereby helps the surgeon to perform the operation easily and satisfactorily.

On the whole, omnopon acts best in elderly patients, and may be safely given in cases where the administration of a general anesthetic might be attended by considerable anxiety and danger. I have used it only when operating upon adults, but Mr. Gray states that "in juveniles above thirteen years of age the effect has been quite satisfactory." To young subjects he gives half the dose usually prescribed for an adult.

If a patient is to have omnopon he should be prepared as he would be for a general anesthetic. An hour and a half before the time fixed for the operation the contents of a 1 cc. sterile ampoule are injected into the muscles of the gluteal region. The patient ought to be in bed during the interval of waiting, and if the room be darkened and care be taken that he is not disturbed by noise, he will usually rest quietly or sleep until it is time to carry him to the operating table. He ought never to be allowed to walk or to be roused more than can be avoided. If a single dose is not enough to induce sleep, an additional half dose is injected an hour after the first. This extra dose is rarely necessary; it can, however, be administered without risk, and ought always to be given if the patient be nervous and excitable.

The writer has used omnopon-scopolamin as an adjuvant to local anesthesia in the following operations upon the eyeball and its appendages—cataract extraction, iridectomy in iritis, and in acute glaucoma, iridosclerectomy in chronic glaucoma, plastic operations on the eyelids, extirpation of the lacrimal sac, and enucleation of the globe. In these different operations omnopon-scopolamin acted least satisfactorily in extraction of senile cataract, because it made the patient so drowsy that the eyeball constantly tended to roll upwards, and thereby hindered the delivery of the lens. N. M. B.

The Bacillus of Bovine Tubercle as a Factor in Phlyctenular Affections of the Eye.

STEPHENSON, S. (*Lancet*, July 18, 1914). We may take it from the similarity in the findings of many observers that the association between phlyctenulosis and tubercle is proved on both clinical and biologic grounds, and can no longer be doubted, even by the most skeptical. The connection, however, has recently entered upon a new and somewhat significant phase. It has been pointed out by Dr. Bywater that the subjects of phlyctenulosis respond to the specific tests for bovine tubercle. The writer's recent observations coincide with Dr. Bywater's.

That the conjunctival phlycten is not a tuberculoma is universally admitted. Nobody has yet succeeded in reproducing tuberculosis by inoculating the anterior chamber of susceptible animals with such products. Tubercle bacilli have not been found in the efflorescence. The lesion itself does not present the histologic structure of tubercle. We may well ask ourselves in what way and by what means a focus of tubercle, latent or manifest, is able to produce a phlyctenule of the conjunctiva or cornea. Leber, as is well known, suggested that the phlyctenulæ were the direct result of dead bacilli set free from a caseous focus elsewhere in the body. The hypothesis was supported by a certain amount of experimental evidence. He found that an inflammation recalling phlyctenular keratitis sometimes followed the injection into the corneal parenchyma of dead tubercle bacilli. To this it has been objected that any foreign substance would do the same. Bruns (a pupil of Leber's) produced changes resembling phlyctenulæ by the injection of dead tubercle bacilli into the blood stream. The best working hypothesis is probably that set forth with conspicuous ability by de Wecker—namely, that the eye disease is due to the circulation of soluble toxins thrown off by the deposit of tubercle elsewhere in the body. The analogy that he institutes with the so-called "toxituberculides" is very much to the point. Those eruptions, as is well known, occur in tuberculous subjects, and yet tubercle bacilli have not been found in them, neither can they be successfully inoculated into guinea pigs. Exactly the same may be said of phlyctenulosis.

The incidence of bovine tubercle as a cause of disease in

human beings is known to vary greatly according to the locality.

If it can be shown that phlyctenulosis is usually associated with the bacillus of bovine tubercle, then the remedy lies at hand in the shape of a pure milk supply. It is indeed possible that if such could be secured by legislation, as at the moment appears to be very probable in England, phlyctenulosis might become one of the rarer affections of the eye in poor children instead of being, as it is at present, accountable for the vast majority of inflamed eyes in that class. The greatest cause of defective sight in childhood might be largely remedied. At all events, pending legislation, it would certainly seem advisable to sterilize raw milk before giving it to infants and children.

N. M. B.

**A Case of Malignant Glaucoma Successfully Treated by
Repression of the Lens.**

ALEXANDER, G. F. (*Ophthalmic Review*, July, 1914), used the following operation in a case where the remaining eye was attacked with glaucoma, and in which there was an increase in tension and pain following iridectomy. He considered removal of the lens, but decided that the iris might be so pressed forward by the hyaloid as to block the filtration angle. He therefore made use of the operation described by Priestley Smith in his book on glaucoma—i. e., repression of the lens (first suggested by A. Weber). A puncture was made in the sclerotic with a Graefe knife, as near the equator as possible and between the inferior and external recti muscles. This was followed by so great a flow of vitreous as to make him fear collapse of the globe. Pressure was then made with a curette on the center of the cornea, so as to push the lens directly backwards. Although the vitreous continued to flow freely, any relaxation of the pressure resulted in the lens once more coming into contact with the cornea. After seven minutes the lens remained back in position and the tension was subnormal. The operation was then concluded. A few minutes after the performance of the sclerotomy blood appeared in the anterior chamber. When the chamber became permanently reestablished this had entirely disappeared.

The subsequent course of this case has been so far, four

months later, entirely satisfactory. The tension has remained a low normal and there has been no pain.

One point in the operation requires comment—i. e., the question of how long the operation should be deferred after the discovery of the forward thrust of the lens following a glaucoma iridectomy. As such a severe rise of intraocular pressure would probably have been sufficient to destroy vision in forty-eight hours, and also considering the simple nature of the operation here described, he is inclined to think that its performance should not be deferred for more than three hours.

The cause of the forward displacement of the lens is, in his opinion, to be found in the stretching of the zonule by repeated attacks of high pressure behind the lens.

The edges of the section having united when the second operation was done, the rapid escape of blood from the anterior chamber affords clear proof that the cure of glaucoma by iridectomy is not dependent on obtaining a previous scar, as many contend, as it clearly escaped at the freed filtration angle.

N. M. B.

Pathology of Cataract—The Hydrolysis Theory.

BURDON-COOPER, J. (*Ophthalmic Record*, May, 1914). These researches originated in the discovery of the aminoacid tyrosin in the aqueous humor, following a discussion for high myopia as far back as 1906. The aqueous humor which escaped from the eye under considerable pressure after the needle was withdrawn was collected, and was subsequently found crystallized after it had been preserved for a time in a sealed tube, and tyrosin was detected among the crystals of phosphat and chlorid of sodium which constitute the major part of the crystalline content of the aqueous. The specimen contained no cholesterin when Liebermann's test was applied to it. The major portion consisted of inorganic sodium chlorid and phosphates. Examined by the microscope, it was seen that the specimen contained two kinds of crystals at least—(1) large cubic crystals which were easily visible to the naked eye, and which were subsequently identified as sodium chlorid; and (2) slender, delicate, needle-shaped crystals, which were highly refractile and polarized light. These gave all the reactions for tyrosin.

In seeking to account for the presence of this body, which

was decidedly unusual, it was found that the crystalline lenses of the lower animals and the human lens, as well as the nails, hair, and enamel of the teeth, structures which are developmentally related to the lens as having the same epiblastic derivation, all yielded tyrosin on hydrolysis with weak acid. It was, therefore, concluded that the change which had been produced in the clear lens by needling it was one of hydrolysis of the lenticular proteid with the production of tyrosin. The lens through the medium of the aqueous is hydrolyzed, and tyrosin is one of the products. The opacity produced is finally got rid of by solution of its soluble constituents.

A distinction is made between lenticular opacities the result of precipitation and the result of decomposition of the lens proteid, and the author thinks the term cataract should be reserved for the latter. A great variation has been found in the aqueous in cases of preliminary iridectomy; although the opacity seemed about the same, the quantity of tyrosin varied, which is accounted for by the irregularity in the growth of opacity. The two exceptions are senile cataract associated with albuminuria and glycosuria, the former showing the largest quantity of tyrosin ever seen in any specimen. The author thinks it is not the result of decomposition of the albumins, with tyrosin getting into the aqueous from the blood stream, but is derived from the lens and is the product of the hydrolysis of the lenticular proteid itself. In cataracts associated with glycosuria, cholesterin was found in large quantities in the lens, in addition to tyrosin in the aqueous and lens, and the author states cholesterin may be a further stage in the same process which leads to the production of tyrosin, or the cholesterin may be the result of the decomposition of another substance in the lens. The color of the cataractous lens is ascribed to the amount of oxidation of the tyrosin.

A comparison is then made of the various theories as to cataractous changes. The article is well illustrated with plates of the various crystalline forms found. N. M. B.

Observations of the Learning of Vision After a Successful Operation, at the Age of Six Years, in a Congenitally Blind Patient.

FISHER, J. H (*Ophthalmic Record*, June, 1914), describes the process of learning to see in a congenitally blind child of six years after recovering sight, and makes comparisons with

the case described by Augstein (*Klin. Monatsbl. f. Augenh.*, Vol. LI, ii, p. 521, 1913).

The author found nothing to support Augstein's view that there are three stages in the recovery of vision, nor can he differentiate between education of the brain and education of the retina; he conceives that education both of the end organ and of the center go on progressively and simultaneously in such cases before ultimate best use can be made of the new-found sense of sight.

N. M. B.

The Simultaneous Correction of Horizontal and Vertical Deviation, Facilitated by a Slight Modification of the Maddox Rod.

BALLANTYNE, A. J. (*Ophthalmic Record*, June, 1914). When hyperphoria coexists with exophoria or esophoria it is sometimes desirable to make a prismatic correction of both deviations. This may be done by placing before one eye a prism with its base up or down to correct the hyperphoria, and another prism with its base in or out before the other eye to correct the horizontal deviation. But a better method is to find the single prism which, set obliquely, will simultaneously correct both deviations. To do this we must first estimate separately the vertical and horizontal errors, and then calculate two quantities, namely, (1) the strength of the resultant prism, and (2) the angle to which this prism must be rotated from the vertical in order to produce the desired effect. According to Maddox, the formulæ for these estimations are: for (1) $R = \sqrt{V^2 + H^2}$, and, for (2) $\text{Sin. } r = \frac{H}{R}$, R being the deviation of the resultant prism, V the vertical deviation, H the horizontal deviation, and r the angle of rotation of the prism from the vertical.

By a very slight modification of the Maddox rod it is possible to arrive at the strength and position of the resultant prism without calculation.

A familiar form of the Maddox rod consists of a disc of red glass, on one side of which half a dozen short segments of colorless glass rod are mounted side by side. A spot of light looked at through this glass is seen as a long unbroken red line. The modification to which I refer consists in separating the two central rods by a narrow chink, say one-third of a millimeter. If the disc is now correctly centered before

the eye, the patient sees a brilliant red spot at the center of a less intense red line. The only other thing needed is a mark on the face of the Maddox disc at right angles to the direction of the rods. The direction of this mark will always indicate to the observer the axis of the red line as seen by the patient.

With the modified Maddox rod placed before the right eye and a light fixed, the right eye will see the shaded red line with a bright red spot at its center; the left eye will see the natural source of light. If the disc is now rotated, there is found to be one position in which the red line cuts through both the red spot and the clear spot. This direction of the line, which, of course, can be ascertained by noting the position of the mark made on the face of the disc, gives us at once the direction in which we must place the base apex line of the correcting prism. The strength of the prism can be ascertained, if desired, by calculation, but it is simpler to find by trial the weakest prism which, placed before the uncovered eye, will cause the two spots to coincide. The prism is placed with its base apex line parallel to the mark on the face of the disc (that is, at right angles to the rods), and its apex pointing in the direction from the white to the red spot.

The conditions will be altered slightly if we desire to correct only part of the exophoria and the whole of the hyperphoria. In that case a weaker prism will be required, and its base apex line must be more nearly vertical. The result is arrived at in this case by first placing before the eye which is covered by the Maddox disc a prism, base in, which accounts for the portion of the exophoria we do not wish to correct. We then proceed as before, rotating the Maddox disc until the red line cuts both spots, and then placing before the other eye the prism which causes the two spots to coincide. N. M. B.

Optic Neuritis and Myelitis.

GOULDEN, C. (*Ophthalmic Record*, July, 1914), in a very interesting paper, reports a case of "Neuromyéélite optique aiguë," or "ophthalmoneuromyelite," and gives in detail a description of the disease, and summarizes as follows:

1. There is a rare condition, named by Devic "Neuromyéélite optique aiguë," in which myelitis, acute or subacute, is associated with optic neuritis, acute or subacute, the acute neuritis accompanying acute myelitis, the subacute myelitis accompanying the subacute optic neuritis.

2. Usually the optic neuritis (frequently papillitis and more rarely retrobulbar) precedes the myelitis. It is very rare for the neuritis and myelitis to appear simultaneously.

3. There is a tendency for both the optic neuritis and myelitis to end in improvement, but complete recovery is very rare, especially in acute cases.

4. Pathologic examination shows that the lesions in the cord may be very diffuse and extensive, but yet they may be confined to one part of the spinal cord, and that may be the lumbar enlargement.

5. The lesions in the optic nerves are most marked anterior to the chiasma, but may extend throughout the optic tracts.

6. The lesions are produced by some common agent acting on both spinal cord and optic nerves. This agent acts directly upon the nervous structures, especially on the white matter, and not by way of the meninges. Most likely it is an infective agent.

N. M. B.

Analysis of Blindness as a Symptom of Hysteria.

AMES, THADDEUS HOYT (*Archives of Ophthalmology*. July, 1914). Two cases of hysteric blindness were relieved by psychoanalysis. Following the theories of some of the modern students of hysteria, that all the physical symptoms and manifestations of hysteria are an expression of purposive mental actions, attempts were made in these cases to find something in the mental lives of the patients that made vision undesirable. In one patient the questioning had to be entirely indirect, as all troubles were flatly denied. The other patient frankly admitted her difficulties.

Case 1 was a girl who for years had been overworked with the cares and responsibilities of her home life. She had had no relaxations and much drudgery. She suddenly became blind, and as a result was able to have rest and quiet. On questioning, she admitted the difficulties. Blindness was to her a form of refuge, and the relief obtained from her work more than compensated for the unpleasantness of the disease. She was made to see that it was her duty to aid in any possible way in recovering her eyesight, and when she had decided this and made the effort to see, there was an immediate return of vision.

Case 2, a man aged thirty-nine years, had an unhappy home

life, and incidentally lost his factory position. Sudden blindness came on. The first few days he was terrified. Later, there came a definite comfort in not being able to see his wife. Following this blindness there seemed to be a change in her attitude toward him; and by searching questioning and through pointing out his duty, the desire was awakened in him to see again, and vision returned.

Ames points out that the prognosis in these cases is not absolutely good, but is quite dependent on the life of the patient. He thinks that patients who reach an understanding of the underlying causes and motives of their symptoms are those who are least likely to have them return.

This article does not lend itself well to abstraction, and should be read in the original by those interested. G. S. D.

Further Experience With the Writer's Method of Shortening Ocular Muscles Without Employing Sutures Under Tension.

O'CONNOR, MAJOR R. P., U. S. A. Medical Corps (*Archives of Ophthalmology*, July, 1914). O'Connor's method of shortening and advancing ocular muscles was published on March 2, 1912, in *The Journal of the American Medical Association*. In the present paper additional cases are described and a further description of the method given.

He was led to devise this new operation on the assumption that no present method is entirely satisfactory, and on account of the necessity for marked overcorrection to allow for slippage. He regards the great defect in all present methods to be the fact that the sutures are under the elastic pull of the muscles.

In his operation the tendon of the muscle is exposed and a strip of it, about one millimeter in thickness, is separated from the margin of the tendon on each side from the sclera to the muscular portion. The central portion of the muscle is now cut away and laid back. A catgut shortening strand is so applied that by drawing it tight a double loop in the tendonous strip is secured. The central portion of the tendon is now sutured down to the sclera with a mattress suture, being careful to produce no tension. The object is to have all the tension taken by the tendonous loops which have been formed on each side. By the time the catgut loops have been absorbed

the central portion of the tendon will have formed a firm attachment to the sclera.

After doing this operation there is no need to confine the patient to bed. Only one eye need be bandaged, and even if tenotomy of the opposing muscle be not performed, no slipping will occur.

G. S. D.

Subjective Examination of the Pupillary Reflexes.

GRADLE, HARRY S. (*Archives of Ophthalmology*, July, 1914), has worked out the details of a test which is not original with him. He emphasizes the difficulty of determining whether there is any reaction of the pupil. The test described can only be used with patients of fair intelligence.

One eye is closed, and a biconcave lens of either thirty or forty diopters is placed before the other. A light of not more than eight candle power is held ten to fifteen feet in front of the patient and is switched on. Through the lens the patient sees a circular disc of light, which immediately contracts, and which represents the image of the divergent rays passing through the lens and bounded by the pupillary edge of the iris.

To test the consensual pupillary reaction, a similar lens and light are used. A ground glass blank is placed in front of the other eye. The eye under this blank is covered and the light turned on. When the maximum pupillary contraction has taken place the hand is removed, and the patient sees through the lens the disc of light contract.

G. S. D.

Some Cases of Staphylococcic Infection of the Eye Treated by Immunotherapy.

CROCKETT, R. L. (*Archives of Ophthalmology*, July, 1914). Three cases are reported in which marked improvement in the condition of the eye followed the injection of staphylococcic vaccine.

G. S. D.

Glasses for Protecting the Eyes in Industrial Processes.

LUCKIESH, M. (*Archives of Ophthalmology*, July, 1914). The problem was to find glasses which would best protect the eye in processes which involve high temperatures and excessive amounts of ultraviolet radiation. Two results must be achieved: the ultraviolet light must be shut out, and the retina must be protected from too intense light.

It is known that rays of light of a shorter wave length than 0.300 micra which are not transmitted by ordinary clear glass are harmful. It is not yet known whether rays of longer wave length are harmful, and in the absence of this knowledge it is conservative to protect the eyes against all ultraviolet rays.

It was impossible to find a neutral tint glass which would absorb all the ultraviolet rays, so it became necessary to combine a glass which eliminates these rays with a neutral tinted glass, to reduce the brightness.

Transmission curves for short wave radiation are shown for various glasses, also spectrograms showing the transmission of various media, with a short wave radiation in the quartz mercury arc and the iron arc. The exposure times and transmission coefficients for visible tungsten light are shown.

For absorbing the ultraviolet rays a yellow-green glass, such as Akopos, was found to be satisfactory. Through this glass colors are distorted less than through other colored glasses, and the relation of the temperature and luminosity for black and gray bodies is practically the same as to the unobstructed eye. This is important in certain industries, such as lap welding. The shade of neutral tint glass to be combined with this depends for its density upon the process involved. For arc welding a very dense neutral tint glass was necessary, while a much lighter shade could be used in the processes which merely involve molten iron and steel. G. S. D.

Microscopic and Chemic Analysis of Four Cases of Blood Staining of the Cornea.

BEGLE, HOWELL L. (*Archives of Ophthalmology*, July, 1914). Four cases are reported exhibiting a yellowish-green discoloration of the cornea, which is found after injury or disease of the eye, accompanied by hemorrhage in the anterior chamber. As the opacity observed is of a greenish or brownish tinge, it has been believed that it results from the entrance of blood coloring matter into the cornea. Repeated microscopic examinations, however, have shown that there is not a direct infiltration of blood, as free red blood cells are absent. Occasionally, however, a brownish opacity is caused by the entrance of free blood cells. Such a case has been reported by Römer.

The most popular view as to the staining is that it is caused

by the imbibition by the cornea of a solution of hemoglobin, and certain observers have found pigment which reacted to tests for iron. In Begle's sections, as a whole, he was not able to obtain definite, positive, diffuse reactions for iron. For various reasons a chemical test of this nature must be more or less uncertain.

Spectroscopic examinations have also been somewhat unsatisfactory. Begle's fourth case furnished an opportunity for such an examination, and this showed a spectrum entirely similar to that of a methemoglobin solution of the same color. This spectroscopic examination, in Begle's mind, conclusively establishes the fact that the stain of the cornea is due to imbibition of a hemoglobin solution.

Imbibition may be favored in injury cases by rupture of the pectinate ligament. In these cases, small, highly refractile bodies occurring in the cornea have been noted by a number of observers, but their identity has not been discovered. They are usually present, but not always. A number of theories have been formulated as to their nature. Baumgarten pointed out their resemblance to moles. Leber noted the similarity of their appearance to certain fibrin deposits which occur in the cornea in the experimental aspergillus inflammations of the eye. Vossius believes that they are due to colloid and hyalin degeneration; Collins, that they represent hematoidin particles. Römer believes that the hemoglobin solution is split up by carbon dioxide into hematin and an albuminous body, and that the latter is precipitated in the crystalloid form of a refractile body.

Begle found these refractile bodies in all four of his cases, but in spite of elaborate studies of their reactions, he is unable to come to a definite conclusion as to their nature. He, however, believes that they are foreign to the cornea, and are derived from the hemoglobin solution. He suggests that they are some elementary, noniron containing, split product of hemoglobin.

G. S. D.

Phlyctenular Conjunctivitis—Its Importance in the Conservation of Vision.

KEY, BEN WITT (*Ophthalmic Record*, June, 1914). A strong plea is made by the author for physicians to take phlyctenular conjunctivitis and keratitis more seriously for the

purpose of visual conservation. A description of the disease is given, and various factors in the etiology are considered. More vision is lost through this disease than is usually realized.

The writer emphasizes the need for systemic treatment, and recognizes the fact that the home and its surroundings form the most important factors. Since these often cannot be reached by the physician, they must be excluded from being a factor by placing the child in a hospital. He concludes that "the careful management of phlyctenular conjunctivitis is the profession's obligation in the struggle for the conservation of useful vision." Useful suggestions as to prophylaxis and treatment are given. (The writer fails to mention the most potent measure for the handling of this disease, the efficient development of social service work in the hospital.—Rev.)

G. S. D.

Ocular Rotations.

VALK, FRANCIS (*Ophthalmic Record*, June, 1914), quotes the opinion of Hansell, that the findings with the tropometer are misleading, and engages in a warm defense of this instrument. He believes that examinations with it should be made in all cases of heterophoria, and that it is a most useful instrument. When we have a case that shows a tendency of the eyes, one or both, to turn inward to an abnormal degree, the tropometer will indicate in which eye the tendency is greatest. It is especially useful in examining cases of dextrophia.

G. S. D.

Some Points Relative to Enucleation of the Eyeball and Sympathetic Inflammation.

CARPENTER, E. R. (*Ophthalmic Record*, June, 1914), considers the various theories to account for sympathetic inflammation, and concludes with a consideration of enucleation of the eyeball and the substitutes for this operation. G. S. D.

Binocular Vision and the Optic Chiasm—A Reply to "The Prism Dioptry Establishes a Dimensional Unit at the Optic Chiasm" by C. F. Prentice.

POFFENBERGER, A. T., JR., Columbia University (*Ophthalmic Record*, June, 1914). Prentice's unhappy suggestion of a "figurative chiasmal image" as a means of making lucid some of the problems of binocular vision is the subject of two more

articles in the *Ophthalmic Record*, June and July, 1914 A. T. Poffenberger, Jr., Ph. D., of the Department of Psychology of Columbia, points out how irrational and how irreconcilable with established facts and theories Mr. Prentice's proposal is. He concludes, as we did in our review of the original article, *ANNALS OF OPHTHALMOLOGY*, April, 1914, that this conception is of less value in making the theory of identical points clear than other means of representing the same facts.—Reviewed by Dr. Walter B. Lancaster, Boston.

Conjunctival Hemorrhage in Typhoid.

LAYSON, Z. C. (*Ophthalmic Record*, July, 1914). This case report was a typhoid patient who has suffered from repeated attacks of epistaxis. For twelve days had been having intestinal hemorrhages and blood in the urine. This was found to come from capillary hemorrhages of the tarsal conjunctiva of the upper lid. Could be controlled by moderate pressure. Later on, four small areas of partially absorbed hemorrhages were seen in the retina. Otherwise, no history of a hemorrhagic diathesis. G. S. D.

Practical Value of Routine Bacteriologic Examination of the Conjunctiva.

SNYDER, WALTER H. (*Ophthalmic Record*, July, 1914), urges the value of routine examination of the conjunctival sac for bacteria. He agrees with Axenfeld, that in many cases a simple smear is more useful than a culture. Culture should be taken when a Gram negative diplococcus is met with or an apparently normal conjunctiva. Cultures are also necessary for a differential diagnosis of the diphtheria bacillus from the bacillus xerosis. The Gram stain is most useful. G. S. D.

Conservation of Vision.

ALLPORT, FRANK (*Ophthalmic Record*, July, 1914), describes the organization and methods for the conservation of vision in this copy. G. S. D.

Lagrange Sclerectomy and the Elliot Trephine Operation.

MELLER, JOSEF (*Ophthalmic Record*, July, 1914). An abridged translation of article published in the *Klinische Monatsblätter für Augenheilkunde*, January, 1914. G. S. D.

On the Treatment of Sympathetic Ophthalmia With Atophan or Novatophan.

GIFFORD, H. (*Ophthalmic Record*, July, 1914), refers to the proposition of Nicolairer and Dohrn, in which the phenomenal increase of the output of uric acid under the influence of atophan was described, and its consequent use in gout and rheumatism. Gifford has used it in about twenty cases of iritis, and found it to be fully equal to the salicylate in controlling the inflammation, and in some cases superior. He, himself, used it in four cases of sympathetic ophthalmia with superior results to those obtained from salicylates. In one case, where delirium followed the salicylate, atophan was subsequently used with marked improvement of the eyes. A reported recurrence in this case was also said to be successfully controlled by the same drug.

Gifford has used ninety grains a day of atophan by mouth, and one hundred and twenty grains by the rectum. The stomach is sometimes upset by it, but the unpleasant symptoms of salicylate are not present. Gifford finds it possible to use large doses, even as much as he has given of the salicylate—i. e., a grain a day for each pound of weight, and in exceptionally bad cases one-third more. In addition, he sometimes gives bicarbonate of soda. He keeps his patient in bed, at least during the latter half of the day, and gives two grams of brandy with each of the last thirty grain doses. Also a glass of water before and after each thirty grain dose by mouth.

G. S. D.

**The Related Figurative Chiasmal and Mean Cyclopean Images.
(Incorporating a Reply to A. T. Poffenberger Jr., Ph. D.,
Columbia University.)**

PRENTICE, CHARLES F. (*Ophthalmic Record*, July, 1914), makes a reply in which he uses the cyclopean eye, as suggested in our review, to help clarify his "disclosures" about a chiasmal image. He fails altogether to answer Dr. Poffenberger's arguments, but reproaches Dr. Poffenberger for not admitting that he "has proven what the hitherto unknown dimensional proportions and distances between the * * * * dual images in binocular vision actually are when faulty deviations between the visual axes exist." Probably Dr. Poffenberger did not deem this "disclosure" of

sufficient importance to take further space to comment on it. As pointed out in our review, it is an elementary application of the well known law governing the relation between the size of object and size of image, using the reduced eye as a basis for calculations.—Reviewed by Dr. Walter B. Lancaster, Boston.

New Operation for Conical Cornea.

TIFFANY, FLAVEL B. (*Ophthalmic Record*, August, 1914). A short consideration of the disease of keratoconus is given. The "new operation" consists in trephining at the limbus, and if this does not suffice, the author advises a second trephining, performed at the opposite point. At the first operation an iridotomy is performed.

One case is described. No tonometric observations on the tension of the eyeball are given; neither is there a refraction record of the case. It is simply stated that the vision in each eye before the operation was 1/60; and afterwards 2/60 in the right, 6/60 in the left. As the patient was under observation only slightly over six weeks after operation, it seems hardly safe to say that the vision was permanently improved.

G. S. D.

Sympathetic Optic Neuritis or Transferred Papilloretinitis Associated With Only a Mild Serous Iridocyclitis.— Report of a Case.

DECHERD, HENRY BENJAMIN (*Ophthalmic Record*, August, 1914). The patient, a colored man, aged thirty-two years, suffered with linear wound of the cornea, iris, lens and sclera. The eye developed a definite, but mild, iridocyclitis. About five weeks later a cloudiness was noted in front of the other eye. A mild cyclitis developed, and the edges of the optic disc became hazy. A week later both eyes showed iridocyclitis, cloudiness of the vitreous and a typical papilloretinitis. Later, a white looking exudate, covering the disc and extending into the vitreous, was noted.

The usual remedies were employed. Enucleation of the exciting eye was refused, and in spite of this, very marked improvement took place, vision returning in the right eye to 20/30, left eye to 20/50.

The writer believes that this was an infection, probably staphylococcic, which traveled from one eye to the other by way of the optic nerve.

G. S. D.

A New Electric Ophthalmoscope.

MAY, CHARLES H. (*Ophthalmic Record*, August, 1914), describes an ophthalmoscope consisting of a small metal filament lamp, of 2.75 volts, enclosed in the handle of the instrument. Divergent rays emanating from the lamp are rendered less divergent by a convex lens immediately above the lamp and then conducted into a solid rod of glass, which acts as a convex lens and then as a prism. The surface of this is silver, to act as a plain mirror, reflecting the rays so that they enter the eye of the patient. The upper extremity of this reflecting device covers only the lower half of the sight hole. The upper half is left free for the eye of the observer. The current comes from the small battery in the handle, and a rheostat is provided. The advantage lies in the ease and clearness with which the fundus can be seen, even by an inexperienced observer.

G. S. D.

Abraham Lincoln—The Diagnosis of Heterophoria Not Only From a Portrait, but From the Diplopia Which Occurred Just After He Was Elected President of the United States in 1860.

HOLT, E. E. (*Ophthalmic Record*, August, 1914). Holt comments on Mitchell's article, which appeared in the May *Ophthalmic Record*, describing heterophoria appearing in one of Lincoln's portraits. He gives interesting historical reminiscences confirming Mitchell's view.

G. S. D.

A Case of Relapsing Acute Iritis Apparently Cured by the Use of Autogenous Vaccine.

PARKER, H. C. (*Ophthalmic Record*, August, 1914). Patient had suffered from an attack of iritis fifteen years previously, accompanied by arthritis. History of gonorrhea sixteen years previously. Present attack showed a typical iritis.

Examination showed signs of a previous urethritis. Cultures were made from the urethral secretion, and a vaccine was prepared. Under injection of this and local treatment,

marked improvement now occurred, although the case had been very resistant to the remedies used before the cause of the disease had been established. G. S. D.

A New Method of Treatment of Chronic Dacryocystitis.

COBB, CAROLUS M. (*Boston Medical and Surgical Journal*, August, 1914). A case of chronic dacryocystitis was unsuccessfully treated by probing. Cobb then tried the result of injections of tincture of iodine into the sac. A number were given, with slow but constant improvement. As a result, the discharge ceased, and it was believed that obliteration of the sac had taken place. A slight bluish discoloration of the sac developed. G. S. D.

ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

BY

ALBERT C. SAUTTER, M. D.,

PHILADELPHIA.

MAX W. JACOBS, M. D.,

ST. LOUIS.

J. W. CHARLES, M. D.,

ST. LOUIS.

Experimental Transplantation of Tumors to the Eye.

HEGNER (*Muench. med. Wochenschr.*, December 9, 1913) found that spontaneous growths have a virulence of five per cent as regards reproduction in the same species is concerned, whereas growths which have passed through one or two transplantations possess a growth-virulence of one hundred per cent. Up to the present time, tumors transplanted to another species have failed of reproduction. Hegner injected a pulp of mouse sarcoma or carcinoma into the bulbi of rabbits, guinea pigs or rats. A growth appeared in the rat eyes, but the virulence rapidly diminished and no metastases could be found. He was able to produce sarcoma in rat eyes from human growths, and once noted a reproduction of such growths in a rat inoculated with such newly formed tumor tissue. At any rate, his findings show that human sarcoma can be reproduced in other species of animals. M. W. J.

Investigations Concerning the Development of the Optic Nerve.

KLECZKOWSKI (*Graefe's Archiv. f. Ophthalm.*, Vol. 85, 1913, Part 13; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, March 19, 1914) concludes from a study of pigs' fetuses and a few human embryos that the neuroglia of the optic nerve is only

up to a certain point of ectodermal origin, that later mesodermal cells play a part in the development. Heretofore it had always been supposed that the neuroglia originated from the ectoderm exclusively. A. C. S.

On the Pathologic Anatomy of Diabetic Toxic Amblyopia.

ROENNE, Copenhagen (*Græfe's Archiv. f. Ophthalm.*, Vol. 85, Part 13: Abst. in *Woch. f. Ther. u. Hyg. des Auges*, March 19, 1914), publishes the histologic findings in two cases of severe diabetes. Clinically in both cases, in addition to central scotoma, there was absolute green blindness.

In one case the optic nerve appeared normal, but the papillomacular bundle showed areas of degeneration at the anterior portion of the chiasm and tract and between the external geniculate body and the tract.

Histologic examination of the optic nerve in the other older case showed areas of degeneration in the papillomacular bundle just behind the eyeball and in the intracanalicular portion of the nerve. Similar areas were found in the anterior chiasmal regions, anterior portions of the tract and to a less extent in the geniculate body.

Uthoff's theory attributing the affection to a primary interstitial optic neuritis is therefore no longer tenable. The process is a degeneration, not an inflammation. A. C. S.

Pigmented and Vascular Nevus of the Iris.

FUCHS (*Græfe's Archiv. f. Ophthalm.*, Vol. 86, Part 1, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, June, 18, 1914). The pigmented nevus is situated in the anterior boundary layer of the iris and represents either an island of markedly pigmented iris or an area of normal iris surrounded by iris less strongly pigmented. While this condition is of physiologic significance, the vascular nevus must be considered a pathologic new tissue formation, consisting in a condensation of tissue elements occurring most prevalently at the sphincter portion of the iris. The vessels of the new formation differ from normal iris vessels which lack adventitia.

Fuchs observed vascular nevi in seven cases of inflammation of less than fourteen days' duration, the iris, too, being involved. The tissue new formation is not inflammatory, but a vascular neoplasm. A. C. S.

A Case of Hydrophthalmos With Anterior Synechiae and Absence of the Lens.

SCHLAEFKE (*Graefe's Archiv. f. Ophthalm.*, Vol. 86, Part 1, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, June 18, 1914) attributes congenital hydrophthalmos to developmental disturbances in the region of the anterior chamber, incomplete development or absence of Schlemm's canal playing the chief part. A. C. S.

Hyalitis and Cyclitis.

STRAUB, Amsterdam (*Graefe's Archiv. f. Ophthalm.*, Vol. 86, Part 1, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, May 28, 1914), attributes to the low resisting power of the vitreous the fact that different etiologic factors may lead to the same pathologic condition—viz., hyalitis. In adjacent tissues the bacteria may result in small areas of localized necrosis, but this bacterial invasion is usually overcome and the microorganisms are forced into the vitreous, where they multiply and give rise to a typical hyalitis. Precipitates on Descemet's membrane have a similar etiology.

Tuberculosis is more often the causal factor than syphilis. In thirty cases of cyclitis he found the iris normal in fourteen. In twenty cases of glaucoma remains of a previous chronic inflammation were found in only three cases. A. C. S.

Congenital Tower Skull.

KUETTNER, Breslau (*Muench. med. Woch.*, 1913, No. 40; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, April 30, 1914), claims this affection to be extremely rare. He reports two cases.

In the first case there was marked tower skull with cranial malformation and decided exophthalmos because of abnormal smallness of the orbital cavities. Optic neuritis. A trephining was done, but death ensued. Examination of the skull showed the characteristic honey-combed structure, including numerous spontaneous trepannings. Internal hydrocephalus.

In a second less typical case X-ray showed distinct honey-combed structure, but without changes in the eye grounds or pronounced intracranial pressure.

He attributes optic neuritis in tower skull to increased intra-

cranial pressure the result of disproportion of the growing brain to the enlarging capacity of the cranium.

In the treatment of these cases timely trephining is of importance. Lumbar puncture, puncture of the corpus callosum, and of the ventricle only prove successful in cases in which increased pressure is chiefly due to increase in the amount of fluid. Schloffer's canal operation is only to be attempted after trephining has proved of no avail. A. C. S.

Intraocular Tuberculosis.

GILBERT (*Muench. med. Wochenschr.*, February 10, 1914) corroborates the opinion that tubercles in the pupillary region of the iris are dependent on foci in the ciliary region. Inflammatory products derived from the tuberculous masses in the ciliary body are carried through the pupil into the anterior chamber and are deposited on the iris, where they give rise to new tubercles. Again, in a case of primary retinal tuberculosis, no bacilli could be found in the areas which had undergone pronounced changes, whereas, in the region of round cell infiltration, numerous organisms could be seen. This would tend to prove that the periphlebitic infiltrations of the retina are not always due to secondary irritation, but that in tubercular disease, for example, the exciting organism is carried away in the vein sheaths or lymph channels and sets up an inflammation at that point. M. W. J.

Concerning Spontaneous Cure of Glioma Retinae.

LINDENFELD (*Graefe's Archiv. f. Ophthal.*, Vol. 86, Part 1, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, June 18, 1914) contributes a third case of spontaneous cure of glioma retinae to the literature. Glioma was diagnosed clinically in both eyes, histologically in only one. Spontaneous cure in these cases was effected by complete tumor necrosis followed by phthisis bulbi. A. C. S.

Ocular Lesions Due to Indirect Visible Light Rays.

SCHANZ, Dresden (*Graefe's Archiv. f. Ophthal.*, Vol. 86, Part 3, 1913; Abst. in *Woch. f. Ther. u. Hyg. des Auges*, June 11, 1914), more and more inclines to the view attributing senile cataract to the short light waves. These rays also cause

electric ophthalmia, and those penetrating the deeper portions of the eye predispose to early fatigue of the eye. Amundsen in his expedition to the South Pole found euphos glasses the best safeguard against snow blindness. A. C. S.

The Treatment of Trachoma.

SLOUTCHEVSKY, Odessa (*Woch. f. Ther. u. Hyg. des Auges*, May 28, 1914), instead of excision of the retrotarsal fold, prefers incision of the retrotarsal fold. The conjunctiva is cocaineized, and then one or more parallel longitudinal incisions are made into the diseased conjunctiva. Free hemorrhage is desirable. Even in cases in which hypertrophy of the conjunctiva still exists, the operation is indicated, the scarification hastening the regression of the obstinate trachomatous process. A. C. S.

Choroidal Detachment After Cataract and Glaucoma Operations.

BOIT (*Vossius' Samml. zwangl. Abhandl. a. d. Geb. der Augenh.*). "A few days after the operation, the anterior chamber, as a rule, is obliterated or much more shallow without a preceding reopening of the wound having occurred. Simultaneously the intraocular pressure is markedly diminished. On throwing light into the eye one sees, on a well-preserved red background, dark, hemispheric, sharply limited prominences. By oblique illumination these projections appear yellow or brown, without folds and with a smooth surface." After these detachments have remained unchanged for some time they often disappear in a few days. This is heralded by the restoration of the chamber and increase of intraocular tension to normal. The fields are limited when taken with small objects—normal with large. Prognosis is usually favorable.

Fuchs explained the detachment by the supposition of a leak in the ciliary body through which the aqueous reached the perichoroidal space, pressing the choroid forward into the vitreous, which is also pressed forward in its turn. He ascribed this escape of aqueous into the perichoroidal space to a capillary attraction by the small spaces between the lamellæ of the suprachoroidea and the easier escape outward from these spaces. By this theory he explains the diminu-

tion of intraocular pressure. The clefts in the ciliary body are attributed to tears during the operation. He found in five eyes enucleated within a few days after operation tears at the root of the iris in two of them, demonstrating the probable frequency of such cases. Detachment of the choroid was not present, but he demonstrated it in eyes which had suffered tears in the ciliary body after trauma. The fact that the detachment does not take place for several days after the operation, Fuchs attributes to a damming by clot, swelling or edema.

Augstein, in 1901, described three cases: First, a detachment (after extraction with iridectomy) with deep anterior chamber and normal tension; second, after glaucoma iridectomy with normal deep chamber, and after reattachment renewed increase of tension; third, anterior sclerotomy for acute glaucoma, without result; two days later, posterior sclerotomy. In three days detachment with deep anterior chamber and normal tension. He claimed that injury of the ciliary body was not necessary to produce detachment, and agreed with Marshall in attributing it to a serous exudate under the choroid.

In 1902, Fuchs reported 37 cases in ten months. He saw 14 detachments in 318 cases of extraction with iridectomy; 9 in 175 cases without iridectomy; and 11 in 111 iridectomies for primary glaucoma—2 after iridectomy in secondary glaucoma. The time of occurrence ranged from the first to the sixteenth day, the majority occurring between the second and eighth days. Sometimes it disappeared rapidly; twice after one day, seven times after two days, but generally very slowly even to thirty days. Increased tension after reattachment was seen only twice, and no other injury of the eyes remained.

Microscopically he examined nine normally healed extractions. Four of these showed flat detachments of the choroid without retinal detachment, serous exudate in the suprachoroides and tears in the tissue of the chamber angle. He saw in three hemorrhagic detachments, encapsulated blood in the perichoroidal space, and ascribed these to rupture of choroidal vessels the result of the sudden lowering of tension—i. e., a half way form of expulsive hemorrhage.

A year later, Axenfeld agreed with Fuchs concerning the origin of postoperative choroidal detachment and recommend-

ed the pressure bandage as a remedy, also condemning the open wound treatment as a reason for the greater frequency of detachments. All of his cases showed great hypotonus.

In 1904, Demaria found, after iridectomy for glaucoma followed by enucleation, a direct communication between the anterior chamber and the perichoroidal space through a fissure which also extended into Schlemm's canal on the opposite side from the iridectomy. The perichoroidal space was filled with blood—there was very little in the aqueous.

Dutzer reported three cases from the Giessen clinic, all occurring under a pressure bandage, but he still believed that its use after extractions accounted for the relatively few cases in that clinic. In 1907, Fischer reported the findings in an eye enucleated four weeks after posterior sclerotomy and iridectomy for glaucoma. The ciliary body in its entire circumference was separated from the sclera almost to its anterior attachment. Choroid and retina were nasally and temporally advanced, and above and below showed a flat detachment. The vorticosae veins were torn away on both sides and injured above and below. The cavity was filled with blood. He attributed the detachment to spontaneous rupture of a vessel predisposed by loss of vitreous. Since all of the microscopic examinations of such eyes after glaucoma iridectomy showed such hemorrhages, he believed that hemorrhagic detachment was more common than supposed, even among those which had been ascribed to serous exudates.

Meller found twenty-two per cent in thirty-six Lagrange sclerectoiridectomies. He explained it by a cutting of the tendon of the ciliary muscle and consequent opening of the suprachoroidea, and referred to its frequent occurrence after very peripheral incisions in the usual iridectomies. Meller brought forward an explanation differing from that of Fuchs. Since detachments similar to those in living eyes occur in eyes which have been hardened in fixing solutions from shrinkage of the vitreous, and especially in the anterior portion where the junction of the choroid and sclera is loose, he believes that a similar occurrence takes place in the living eyes of older people through loss of elasticity of the sclera and the loss of aqueous with diminished tension. The same is true in glaucoma, and the difference in intraocular pressure before and after operation is greater. After operation and escape

of aqueous the very active secretion from the ciliary processes may lead to obstruction and leakage into the perichoroidal space. By closure of the chamber the aqueous no longer escapes and the delay in detachment is thus explained, as well as the greater frequency of detachment after the Lagrange, because the chamber is open longer.

Elliot's operation has been followed by choroidal detachment: Paderstein reported one case in the May session of the Berlin Ophthalmological Society. Recently Schur described three in eighty-five trephinnings, agreeing with the view of Fuchs as to their origin. Meller, comparing Lagrange and Elliot, found 7.7 per cent in his trephinnings.

Boit reports two cases after iridectomy, with the microscopic findings. Also seven cases in sixty-seven Elliot's, and three others, one after extraction, one after extraction and iridectomy in subluxation of the lens and glaucoma, and one after simple glaucoma iridectomy. In addition four extractions not sufficiently observed for detailed description.

He did not include possible transient cases after the Elliot operation. His first case was an iridectomy for glaucoma, with rather copious hemorrhage from the iris. On the following morning the wound gaped, and the lens and much vitreous were found on the bandage. Enucleation eight days after the iridectomy. The retina was lying folded in the vitreous and in the wound. The choroid was separated by hemorrhages, except around the nerve and in a few sections at the equator. There was no tear in the ciliary body nor communication between the chamber and perichoroidal space in any of the serial sections.

His second case, examined microscopically, was an old injury, followed by glaucoma. He made a broad iridectomy, capsulotomy, extraction with the loop, some loss of vitreous, copious bleeding, nausea, vomiting, and there was blood and vitreous on the bandage the same evening. Enucleation in thirteen days. Serial sections of half the eye gave: choroid detached by blood from close to the ciliary body to two disc diameters from the nerve. The retina was detached by blood from the choroid. There was no tear in the ciliary body. In neither case was there encapsulation of the blood, as found by Fuchs and Fischer.

In his last three cases, detachment occurred on the eighth,

fifth and fourth days after operation, with shallowness of the anterior chamber and diminution of intraocular pressure. The wounds were closed on the day after the operation, the anterior chamber deeper, and there was no gaping of the wound. Reattachment took place twice in six days, once in thirty days, with deepening of the chamber and increase of tension. Diminution of vision and narrowing of the fields disappeared, leaving no permanent injury. The contents of the detachment were apparently serous, with a small amount of blood (transillumination). In the Elliot operations he argues against the possibility of a Fuchs dehiscence, on the ground that neither the iris nor ciliary body is torn, and the aqueous would escape through the wound rather than through any other less convenient opening. He therefore inclines to the theory of Marshall and Meller, and concludes that the probable origin of choroidal detachment in these cases is an exudate from the choroidal vessels into the perichoroidal space.

J. W. C.

Present Status of the Therapy of Tuberculosis of the Eye.

HERTEL, E. (*Vossius' Sammlung zwangloser Abhandlungen aus d. Gebiet der Augenheilkunde*), after reviewing the older surgical and conservative medical remedies, reports his conclusions based on the treatment of fifty-seven cases. He included only those under observation one to three years after treatment. Their tubercular nature was established by the clinical picture, general examination, Roentgen diagnosis and reaction to tuberculin. He found thirty-six cases of iritis or iridocyclitis, nine of choroiditis, six of parenchymatous and sclerosing keratitis, two of scleritis, three of retinitis and one of conjunctival tuberculosis. He left out of consideration cases of lupus and lacrimal sac tuberculosis (surgical) as well as phlyctenular disease. Treatment embraced atropin, warm compresses, saline injections, general nourishment. Diagnostic tuberculin was always employed and therapeutically in most cases.

He divided his cases into three groups: Group I, those yielding no results—the process was progressive during treatment, and there was no improvement under later observation. Of these, there were fourteen of iritis or iridocyclitis, two of keratitis, two of choroiditis and one of retinitis. There were

the two enucleations in the above mentioned cases, two of phthisis bulbi, not prevented by months of tuberculin, and one of choroiditis which progressed in spite of several courses of tuberculin, showing nodules in the iris, deposits on the membrane of Descemet; hand movements was the best vision obtainable after three years. Two cases of keratitis parenchymatosa with no signs of lues and a negative Wassermann, but a strongly positive tuberculin reaction, came with a light opacity which progressed to grave destructive changes in spite of tuberculin, inunctions and local treatment. In one case of extensive retinal and vitreous hemorrhages in a man with positive tuberculin reaction and a lung lesion, the hemorrhages disappeared, the vitreous cleared and the vision became normal. But this had also occurred in a former, similar, attack from which he had recovered under saline injections and potassium iodid. Six months later he returned with fresh hemorrhages and vision reduced to hand movements. He refused treatment and continued at work. Six months later there was almost complete disappearance of the hemorrhages in the periphery, fine white strands in the retina as in retinitis proliferans; and the vision almost normal.

The remaining cases of iridocyclitis were slowly progressive. At first they seemed, from the clinical aspect, less grave and probably amenable to treatment with tuberculin; but seven had at the last examination only traces of vision, pupils closed, and deep changes made improvement hopeless.

The other cases were severe iridocyclitis with threatening outcome in phthisis bulbi or secondary glaucoma. Two of these cases were said later to have lost vision. Three had not been heard from.

Group II comprised twenty-five cases which improved under treatment and healed under observation. Only one case recurred, but it again healed. The first case was a young man of tubercular family, who came with repeated inflammations of the right eye, treated elsewhere with mercury injections, sodium salicylate, etc. There were present the effects of severe iridocyclitis, total closure of the pupil, secondary glaucoma and complete amaurosis. The other eye had a recent iridocyclitis, thick deposits on the membrane of Descemet, nodules in the chamber angle, pupillary exudate and vitreous clouding. Physical examination and positive tuberculin re-

action established the tuberculous nature of the ocular affection. A course in tuberculin resulted in cure of the iridocyclitis. Recurrences recovered later under tuberculin, with useful vision one and one-fourth years after the last attack.

The second case was a woman with double tuberculous iridocyclitis which apparently recovered after two courses of tuberculin, although the vision of one eye was lost because she declined iridectomy for a secondary glaucoma.

The third case was a severe scleritis with tendency to ulceration—recovery free from recurrences. A year later the other eye had a severe scleritis—ulceration of the protuberances and danger of perforation. Under tuberculin all of the prominences healed and the patient was sent to Leysin.

There were also two solitary tubercles of the choroid. Both were recent eccentric foci, the one giving a distinct focal reaction, which was indicated by increased cloudiness and fresh hemorrhages. Both foci healed under tuberculin, leaving oblique discolored scars. Vision good. There was no more trouble in one after two, and in the other after almost three, years. There was also one case of conjunctival tuberculosis plainly improved under tuberculin. The other favorable results were ten cases of iritis, five of choroiditis exudativa disseminata, three of sclerosing keratitis and one of scleritis.

The third group comprised the cases showing no result during treatment, and many a certain aggravation. But these unfavorable results are to be distinguished from Group I, in that later examination gave improvement which was often surprising. There were ten cases of iritis or iridocyclitis, some severe, with thick deposits on the posterior corneal surface, extensive nodule formation, pupillary adhesions, vitreous clouding and poor vision. At the last, recent examination, the vision in all was improved; in several, normal. The degree of healing was surprising in an observation time of two or three years, and nothing could be seen on the iris with the Zeiss binocular corneal microscope.

Also one case of parenchymatous keratitis with a negative Wassermann but strongly positive tuberculin reaction, and two cases of chorioretinitis showed striking after-improvement objectively and in function.

One might feel that these effects were the after-effects of treatment; consequently the number of results would rise from

25 to 38 of the 57 cases; but the time elapsing in one case was very long, and in only four cases was the course completed. In five cases it was discontinued after only one or a few injections, and in the four remaining cases tuberculin was not begun. He is therefore constrained to believe that many in the second group might have healed spontaneously, and that also among the unfavorable cases of the first group, later control examinations might have shown improvements or spontaneous healing. v. Duyse, Haensell, Leber saw improvement after nine to eleven years.

The spontaneous cures in the thirteen cases of Group III equal twenty-two per cent, and he felt that of Group II no more than forty-two per cent could be called improved. In other words, forty-two per cent minus twenty-two per cent equals twenty per cent. Lowenstein in a great mass of material found at least thirty-two per cent, and Roepke thirty-six per cent more cures than had been obtained before the tuberculin era. One can only estimate the eventual superiority of the tuberculin treatment from a great series of cases in which other methods have failed and improvement or cure followed the introduction of tuberculin. The number is still too small. Then the reverse must be considered: the tuberculin discontinued and healing resulting from climate, etc., or spontaneously. He gives the results obtained in experimental tuberculosis. Doenitz found Alt Tuberculin a certain remedy in experimental tuberculosis in the eye of the rabbit; Sattler agrees with his conclusions. But many investigators obtained no results, Alexander and Bass even maintaining an aggravation. Zimmerman obtained with Neu Tuberculin good results in inoculation tuberculosis of the anterior chamber, but Baumgarten and Waltz saw no effect from small doses and injury from large ones. Schieck found no difference in cases of inoculated tuberculosis handled with tuberculin from those not so treated. Haupt found in a large number of cases of inoculated tuberculosis treated with long continued increasing doses no results in inoculation tuberculosis of the anterior chamber in the rabbit or the hind leg of the guinea pig. Also the pathologic examination gave no evidence of healing (encapsulation, cicatrization, etc.). Krusius in intracorneal inoculation of the rabbit found no certain specific result—perhaps a slight shortening of the process. Hertel concludes that

the tuberculin treatment of inoculation tuberculosis has not been successful, but he feels that the inoculated bacillus must be more resistant than the few which reach the eye through the blood, and that the latter are already weakened by the protective substances of the blood. On the other hand, we must not forget the tendency of ocular tuberculosis to heal without treatment.

Choice of Tuberculin.—The Koch preparations, Alt Tuberculin and tuberculin T. R., furnish only an antitoxic immunity. A bacterial immunity in tuberculosis has not been reached. The bacilli emulsion containing the bodies of the bacilli furnish a more thorough immunity, as shown by the reaction it causes after immunization with the Alt Tuberculin, and the reverse does not occur. It would therefore seem to be the remedy of choice in ocular tuberculosis. Immunizing attempts are the more effective the more kinds of substances the antigen contains. Therefore the emulsion often causes a stronger reaction than the Alt Tuberculin, and it is the general reaction which we wish to avoid. The general reaction depends not only on the kind of material injected, but also on the extent and severity of the tuberculous processes in the body. Most ocular affections are not associated with discernible general tuberculosis and are in relatively strong patients, so that it is a matter of indifference what tuberculin is used, and especially when the dosage is cautious. The focal reaction is stronger with Alt Tuberculin. Therefore it is best for diagnostic purposes. In order to avoid it in treatment, v. Hippel uses the Neu Tuberculin, T. R., and later the emulsion. Neu Tuberculin is generally commenced with very small doses and is very gradually increased.

Against the followers of Wright, who would continue with very small doses, on the ground that the increase of the opsonic index is not essentially greater with large than with small doses, he contends that since the establishing of the opsonic index has too many sources of error and takes too much time, it is ill adapted to the treatment of ocular affections. We must heal an eye as quickly as possible, and that through the hyperemia of a carefully regulated focal reaction—one not strong enough to cause destructive changes of tissue. He has seen the best results in those cases in which focal reactions were obtained. In the work of v. Hippel, it is the severe

cases in which the focal reaction is often mentioned, but he speaks of healing in spite of it. If we regard a slight focal reaction as favorable, Hertel considers the Alt Tuberculin, especially the albumose free ("A. F."), the best of the Koch preparations.

Recurrences.—Davids, a pupil of v. Hippel, considers recurrences less frequent after emulsion treatment than after the other Koch preparations. Hertel believes that Davids' observation was too short after the emulsion to infer protection from recurrences. At least v. Hippel's cases under Alt Tuberculin and Neu Tuberculin, T. R., were much longer under observation. Certainly, recurrences after emulsion have been observed. Hertel saw them repeatedly, even after several courses, and believes that its greater protection has not been proven. The best protection is a sufficiently long continuation of the primary course of treatment—i. e., until all signs and symptoms disappear, and as long as the slightest focal reaction takes place under increasing dosage. After the case is dismissed, the patient is kept under observation. He does not approve of a prophylactic course in tuberculin similar to that used in the inunction treatment, because the effect of tuberculin is still uncertain.

He mentions the other derivatives (of tubercle bacilli) of Denys, Beranek and Rosenbach, and sees no special reason why they should be preferred to those of Koch. Passive immunizing remedies, such as the serum of Marmorek, have been little used in ocular disease except in keratitis scrofulosa, and their effect is disputable.

Hertel concludes that in spite of the haziness of our knowledge concerning the best method of application, we have increased the proportion of cures by means of tuberculin; yet we are not justified in giving up the other conservative therapeutic methods, and it must still remain only complementary to them.

J. W. C.

The Nonoperative Treatment of Senile Cataract.

MEYER-STEINER, Jena (*Woch. f. Ther. u. Hyg. des Auges*, April 16 and 23, 1914). His treatment consists in the administration of small doses of iodid or iodglidin combined with conjunctival instillations of one-half to one per cent sodium iodid solution twice a day, or a mixture of one-fourth to one-

half per cent dionin solution and iodid solution. Measures directed towards correcting faulty metabolism are also utilized.

Visual improvement is usually noted within twelve to fourteen days, maximal improvement generally occurring at the end of the first month.

Out of fifty-four eyes treated in this manner only four showed further deterioration of vision. Seven eyes remained unchanged and forty-three showed more or less improvement; in other words, four-fifths of the eyes treated responded favorably. In twenty-three, vision improved to 5/6 to 5/5, the original vision in these eyes varying from 5/6 to 5/30.

He believes this treatment in order in every case of incipient cataract; of course, it may be necessary to modify the treatment somewhat to suit the individual case. A. C. S.

Local Anesthesia in Ophthalmology with Novocain-Potassium Sulphate.

GEBB (*Muench. med. Wochenschr.*, March 3, 1914) used the following prescription:

Novocain	0.05
Sol. kal. sulf. (2%).....	20.0
Sol. sod. chlorat (0.9%).....	ad. 100.0
Sol. suprar. hydrochl. (1-1000).....	gtt. xx

He reports excellent results in tear sac extirpations, ptosis operation of Hess, enucleations, lid plastics and exenterations of orbit. Only in rare cases did the patient have headache, visual disturbances or suffer with nausea after using this mixture. M. W. J.

Durability of Solutions of Scopolamin.

BECK (*Muench. med. Wochenschr.*, January 20, 1914) found that there is no difference between the potency of old and fresh solutions of scopolamin. He used six months' old solutions and freshly prepared material. M. W. J.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

BY

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CINCINNATI.

A Study of the Pathogenesis of the Ocular and Auditory Lesions Seen After the Use of Salvarsan.

TERRIEN, F., AND PRÉLAT, P. (*Essai de pathogenie des lésions oculaires et auditives observées après l'emploi du salvarsan*, *Archives d'Ophthalmologie*, Vol. XXXIV, January 1914, p. 23), recite four cases in which auditory and ocular lesions followed the use of salvarsan. Herewith a brief resumé of the histories:

1. A physician, aged thirty-five years, in perfect health. Chancre on penis in July, 1910. Two courses of sixty pills of protoiodid of one-sixth grain, six pills a day, with a fortnight's interval. In December cervical and axillary adenopathy, and some buccal syphilides. Twenty intravenous injections of cyanid of mercury, one centigram to the cubic centimeter. In March, 1911, a new series was begun, but abandoned after the sixth injection, on account of intestinal disturbance. Three injections of gray oil. At the end of March a mild iritis of the left eye developed. Of his own accord, and in spite of the remonstrance of his physicians, the patient received an intravenous injection of 0.40 salvarsan on April 8th, and a second one on April 15th. Two days later the iritis was worse, and the vision had sunk to 0.2, with marked papillitis; field for colors somewhat contracted, colors not well recognized. At the same time the patient complained of a total left-sided deafness. Twenty injections of benzoat of mercury and of bibromat of mercury were given,

under which the eye conditions rapidly improved, the vision being 0.7 on May 15th, the papillitis having disappeared, and the field for form being normal; but the deafness remained unchanged. Another, somewhat irregular, course of mercurial treatments was given, under which the vision rose to 0.9, but the ear condition was still the same. The patient left Paris a few weeks later, and was killed in an automobile accident on the 20th of August.

2. C. E., aged twenty-eight years. Preputial chancre in February, 1913. May 2d intravenous injection of 0.45 salvarsan; May 8th, 0.45; May 21st, 0.60. June 15th, severe headache, lasting several days. June 18th, ringing in the ears and rapidly decreasing hearing; in a few days the deafness became almost complete, and so remains. July 7th photophobia, ocular and periocular pains, marked iritis, and beginning papillitis. Vision equaled hand movements at twenty centimeters. Wassermann negative. Under intravenous injections of cyanid of mercury the eye condition improved rapidly, but the deafness persisted.

3. F. R., aged twenty-eight years. Chancre June, 1913. During the month of July one injection of 0.3, and two of 0.4 salvarsan. In the last days of August violent frontotemporal headaches, accompanied by a marked diminution of hearing in the left ear, and followed in a few days by ocular trouble. When seen in October he presented a complete paralysis of the right abducens; eye otherwise normal, except a fullness of the vessels in the fundus. Complete deafness of the left ear, which had persisted unchanged since the beginning of September. Wassermann positive; lumbar puncture shows fluid under hypertension, rich in albumin, and containing a large number of lymphocytes and large mononuclears. In December, after ten injections of arqueritol in the gluteal region, there was marked improvement of the ocular paralysis, but the hearing had improved only to hearing a watch at five centimeters. The patient had, before his infection, a very large mass of cervical glands on the right side, which had been incised and drained several times; after the use of salvarsan this mass grew much smaller.

4. L., forty years old, contracted a chancre in May, 1912. A month after infection he received a dose of salvarsan, and eighteen days later a second dose. Six days after the second

injection, photophobia and disturbance of vision. He subsequently received two intravenous injections of cyanid of mercury. Four months after infection he was seen at the Hotel Dieu, presenting a well-marked optic neuritis of both eyes, and an iritis of the left eye. Vision of right eye equaled 0.4 with — 1.25; of left eye equaled 0.2 with — 1.25. Field for form highly constricted; colors not recognized. After a series of injections with soluble salts of mercury, which, strange to say, gave rise to an urticarial eruption, the sight of the patient's right eye improved so that in April, 1913, the vision was nearly normal, but the vision of the left eye had gone on diminishing. Field for form was still highly constricted, somewhat less on right than on left. (If there was any disturbance of hearing in this case, the authors have forgotten to mention it).

The question at once arises whether these complications were toxic accidents due to the elective action of the arsenic compounds on the nervous system in general, and the cranial nerves in particular, or whether they were syphilitic manifestations coincident with an insufficient treatment. Certain authors have laid the blame at the door of the new therapy, because of the greater number of these ocular accidents, and their early appearance, often at the onset of the secondary period. Schnabel and Schenkl found twenty-five to thirty-five per cent of recent syphilis showing eye complications; Wilbrand and Staelin found optic neuritis in twenty per cent of syphilitics. While our authors consider these figures as too high, they cite them as showing the frequency of ocular syphilis in patients treated according to the classic methods. Bistis, on the other hand, treated one hundred cases with arsenobenzol, some of whom received two injections; five of these showed ocular lesions before the injections, none developed an ocular trouble after the injections, whence he concludes that 606 is not a source of danger for the eye, and that changes in the optic nerve do not constitute a contra-indication for its use. Fleming goes even further, and states that he has seen these changes distinctly benefited by the use of 606. The authors, after devoting some space to proving that the eye lesions in their cases were not precocious, conclude that they were due to syphilis, and came on in spite of the use of 606.

In the same vein the authors try to prove by the statistics of Habermann in sixty-six cases of labyrinthine syphilis, that the ear lesions were not precocious; Habermann found ear lesions in two cases in three weeks, in two cases in four weeks, in two cases in five weeks, in three cases in six weeks, one case in seven weeks, in two cases in eight weeks, in four cases in nine weeks after the chancre. Rozier has noted labyrinthitis in two cases almost at the same time as the chancre. O. Mayer says: "A lesion of the auditory nerve may appear three weeks after the initial lesion—i. e., in the sixth week of the disease. It is most frequent during the first semester. In the majority of cases it begins with tinnitus; in at least one-half of the cases there is also vertigo. These symptoms may possibly be present before the appearance of the roseola, and are a part of the prodromal manifestations of the syphilitic affection."

The authors conclude that in three at least of the four cases cited the sensory lesions were due to the syphilitic virus. They think that a syphilitic meningitis can be held accountable for them, in view of the synchronism of the lesions. They think this is further proven by the amelioration of these conditions after the continued use of salvarsan and mercurials, as it does not seem probable to them that a toxic lesion would yield to arsenic and mercury. They do not lose sight of a possible Herxheimer in the first and fourth case, but they seem determined to make the syphilitic infection the cause of all the lesions.

M. W. F.

Removal of Six Orbital Cancers With Preservation of the Eye.

ROLLET, Lyons (Six ablations de cancers orbitaires avec conservation de l'œil. Résultats éloignés, *Archives d'Ophthalmologie*, Vol. XXXIV, May, 1914, p. 257), under this misleading title, describes the results after the removal of three sarcomata, two endotheliomata, and one epithelioma. In one of the cases of endothelioma there was a return after six and one-half years. In none of the cases was there any ganglionic involvement. Rollet does not enter the orbit by way of the bone, but through an incision at the external orbital margin, the lids having been sewed together with two silk sutures. He claims that there is a subaponeurotic cavity; the orbital fat does not enter into relation with the orbital periosteum, but is enclosed in a sac of the fineness of gold beater's skin,

so that the finger can be introduced into a cavity in which neither muscle nor fat show, nor is there any flow of blood. Many of the malignant and benign tumors run their course in this cavity, and can be removed without encroaching upon the musculoadipose cone. The neoplasm compresses the optic nerve against the inner orbital wall, and presses the eye forward.

The unfavorable prognosis of Delens in regard to carcinoma of the orbit, and he regards sarcoma as even more unfavorable, is due to the fact that he is considering tumors operated at a late stage, after adhesions had formed and the protruding tumors had ulcerated. The most important point is that these tumors should be operated on as early as possible, even before a prolonged compression of the optic nerve has given rise to optic atrophy.

M. W. F.

Retinal Asthenopia.

AUBINEAU, A., Nantes (L'asthénopie rétinienne, *Archives d'Ophthalmologie*, Vol. XXXIV, May, 1914, p. 264). This is a plea for the better recognition of asthenopia of nervous origin, and presents, with one exception, nothing that cannot be found in the better textbooks, but is too often ignored in our spectacle craze. Aubineau points out the frequency of neurasthenic taint in ascending and descending directions, the mother being in most cases neuropathic, the father often alcoholic. In some of the cases either the patients themselves or their near relatives were, or became, insane.

M. W. F.

The Treatment of Ocular Tuberculosis.

BEAUVIEUX, Bordeaux (Traitement de la tuberculose oculaire, *Archives d'Ophthalmologie*, Vol. XXXIV, May, 1914, p. 278). A somewhat lengthy article, giving a good review of the subject without containing anything new. Like our authors, Beauvieux considers the use of tuberculin in young subjects showing the granulomatous form harmful rather than beneficial, and advises early enucleation. He warns against being content with good results obtained after one course of tuberculin treatment, as he has seen a number of recurrences, and advises two or three series of preventive injections, interrupted by intervals of general upbuilding. Beauvieux uses the tuberculin C. L. from the Pasteur institute at Lille. The

dose is gradually increased until the patient is cured, improved, or shows intolerance. Beginning with 1/1000 of a milligram, or less, the dose is increased every second day by 1/1000 of a milligram until 1/100 of a milligram has been reached, when it is increased by 1/100 of a milligram until 1/10 of a milligram, etc. The temperature should never exceed 99.5°; if this is exceeded, the dose causing the rise in temperature is repeated until it fails to cause a reaction. In very sensitive patients the increase may take place by 1/2000 of a milligram. These injections benefit, of course, the patient's general condition, while producing the local effects. M. W. F.

The Correction of Astigmatism With Regard to Military Service.

LAGRANGE, FELIX, Bordeaux (De la correction de l'astigmatisme au point de vue du service militaire, *Archives d'Ophthalmologie*, Vol. XXXIV, No. 7, July, 1914, p. 402). In the German, Swiss, and Swedish armies the wearing of cylindrical lenses is allowed; the French, Italian, and Belgian armies admit spherical correction only. The latter allege that astigmats cannot shoot well, that the price of cylindrical lenses is high, and that each astigmat wears an "individual" glass. Lagrange makes a plea to admit at least those astigmats whose vision can be raised by means of plain cylinders to the military requirements of 6/12, contending that the price of simple cylinders is not high, and that they can be replaced in case of loss by cylinders cut round and fitted into frames with side screws which allow the lenses to be clamped in at any desired axis. M. W. F.

External Tarsorrhaphy for Spasmodic Entropion.

CANTONNET, A. (La tarsorrhaphie externe dans le traitement de l'entropion spasmodique, *Archives d'Ophthalmologie*, Vol. XXXIV, July, 1914, p. 416), recommends an external tarsorrhaphy of four to five millimeters in length for the spasmodic entropion occurring in young children and elderly people. This measure does not occasion any more pain than the insertion of a silk thread through the lid, and in three days the bandage may be left off. The deformity of the palpebral orifice is much less than one would think, and the tarsorrhaphy can be reduced a millimeter at a time after the desired effect has been produced. The author thinks that this soldering to-

gether of the eyelids makes it impossible for one to swing around without the other, and thus prevents the recurrence of the entropion. (This operation has always been recommended for the opposite condition from entropion, but the author assures us that he has tried it repeatedly with success. Beard says in his textbook of Ophthalmic Surgery that external tarsorrhaphy should never be done if one expects later to undo the work.) M. W. F.

Prognosis as to Gravity and Duration of Affections of the Anterior Part of the Eye.

GRANDCLEMENT (Possibilité de prévoir et d'indiquer d'avance le degré de gravité et la durée approximative des affections de l'hémisphère antérieur de l'œil, en particulier de celles de la cornée, *Société française d'Ophthalmologie*, Paris, May, 1914). The prognosis as to duration and severity in such conditions as keratitis, iritis, iridocyclitis, and iridochoroiditis can be made with a reasonable amount of certainty by observing two points. If the pain remains periorbital, not going beyond the temple and brow, and if atropin quickly produces a dilatation which lasts for twenty-four hours, the case will be one of moderate severity and duration. If, on the other hand, the pain extends to the neck and teeth, and if, in spite of repeated instillations of atropin, it takes days to produce a dilatation which lasts for a few hours only, then we are dealing with a grave condition, in which the prognosis should be made with reserve. (Author's abstract in *Revue Gén. d'Ophthalmologie*, May, 1914, p. 203.) M. W. F.

Variations in Ocular Tension Consequent to Osmotic Phenomena.

HERTEL (Les variations de la tension oculaire à la suite de phénomènes osmotiques, *Société belge d'Ophthalmologie*, Ghent, August, 1913, *Revue Gén. d'Ophthalmologie*, Vol. XXXIII, June, 1914, p. 275). When chlorid of sodium and sugar are incorporated into the organism, either by way of mouth or by intravenous injection, the ocular tension diminishes. The same happens after the introduction of other substances: acetat of sodium, sulphat of sodium, phosphat of sodium, the butyrates, urea, gelatin. Experiments on rabbits prove that the blood pressure is unaltered. Even increasing the blood pressure by injections of adrenalin has no influence on an eye in which the tension has been diminished.

The author produced experimental glaucoma in a number of animals; the intraocular tension was lowered by saline infusions. In a clinical case of glaucoma, in which the tension registered fifty-two millimeters of mercury, there was a drop of twelve millimeters in twenty minutes after an intravenous injection of one hundred and eighty cubic centimeters of a ten per cent solution of cholid of sodium; the pupils which had defied myotics contracted ad maximum after the infusion.

M. W. F.

Carbonic Acid Snow in Granular Conjunctivitis.

WIBO (Note sur la cautérisation carbonique dans le traitement de l'ophtalmie granuleuse, Académie de Médecine belge, December 28, 1912), having noted the good effects of carbonic acid snow in similar skin lesion, tried carbonic acid snow in granular conjunctivitis, with, as he thinks, encouraging results.

M. W. F.

Papilloma of the Conjunctiva.

ECKMAN (Un cas de papillome de la conjonctive, *La Presse Médicale Belge*, June 27, 1913) believes that the most effective treatment for this condition is exposure to radium. Papillomata of the conjunctiva, which are analogous to nevi of the skin, are very rare. They are originally benign, but easily change into malignant epitheliomata. Excising is often followed by a recurrence.

AGRICOLA (*Klin. Monatsblätter für Augenheilkunde*, Vol. LXI, 1913, p. 776) confirms Eckman's statement by the report of a case in which a papilloma of the conjunctiva had been excised and cauterized four times. Finally repeated applications of five milligrams of mesothorium, enclosed in a capsule of hard rubber with an opening of one millimeter, brought a rapid and definite disappearance of the tumor.

M. W. F.

Antigonococcal Vaccin in Blennorrhagic Ophthalmia.

BAR AND LEQUEUX (Emploi du vaccin de Nicolle et Blaizot dans l'ophtalmie blennorrhagique, Société d'Obstétrique et Gynécologie de Paris, December 8, 1913) used antigonococcal vaccin in a severe case, with cure in twenty-four hours. This method, while giving excellent results, is without danger.

M. W. F.

ABSTRACTS FROM SPANISH OPHTHALMIC LITERATURE.

BY

WILLIAM H. CRISP, M. D., OPH. D. (COLO.),

DENVER.

Palpebral Myiasis.

LAGLEYZE, P., Buenos Aires (*Boletin de la Sociedad de Oftalmologia de Buenos Aires*, 1st year, No. 1). A man of twenty-four years came on account of three growths which had been forming for a month on the left side of the face, one being on the upper eyelid. The tumor on the lid was opened in the belief that it was a boil, and in the pus which escaped was a larva 16 mm. long by 8 mm. broad. A similar larva was found in each of the other two growths. The grubs were classified as those of "dermatobia cyanaventris," a fly.

Leontiasis Ossea.

LAGLEYZE, P., Buenos Aires (*Boletin de la Sociedad de Oftalmologia de Buenos Aires*, 1st year, No. 1). The patient was a woman of nineteen years. No other member of the family had ever suffered from the disease, and the parents were not consanguineous. Seven years earlier she had fallen from a ladder, receiving a severe contusion at the root of the nose. The bruise healed promptly, but five months later the root of the nose began to increase in size, and the cheek bones became more prominent. Three years before coming to the clinic the patient became blind after suppuration in both eyes. The right eye had an almost completely adherent leucoma, with atrophy of the eyeball. The left eye had corneal leucoma and posterior synechiæ of the iris. Both lacrimal canals were completely obliterated. Outside the great enlargement of the bridge of the nose and of the cheek bones, there were no other defects of the bony skeleton.

Hypophyseal Tumor Without Acromegaly and With Ocular Symptoms.

NOCETI, A., AND HOUSSAY, B. A.; Buenos Aires (*Boletín de la Sociedad de Oftalmología de Buenos Aires*, 1st year, No. 1). The patient, a man of thirty-five years, had been subject in childhood to violent supraorbital neuralgias, but they had disappeared for the past six years. His mother had also been subject to similar neuralgias, but no other member of the family. In 1905 there was partial temporal hemianopsia in the left eye. In 1907 the right eye showed temporal hemianopsia, absolute above and relative below. In 1910 there was complete temporal hemianopsia of each eye, and the vision was: Right eye, $1/3$; left eye, $2/3$. In the course of the next two years the right eye became entirely blind. In 1913 radiography of the head showed the sella turcica to be enormously enlarged, measuring 30 mm. long by 18 mm. deep. There was no acromegalic change in the cranium or extremities. There was no dystrophy or genital hypofunction. Ingestion of 200 g. of glucose failed to produce glycosuria.

Dermoid Cyst of the Orbit.

DODDS, LIONEL, Buenos Aires (*Boletín de la Sociedad de Oftalmología de Buenos Aires*, 1st year, No. 1). This was the only case of its kind seen between the years 1905 and 1913 in a total of 39,876 patients examined in the Buenos Aires clinic. The patient, a man of thirty-six years, stated that three months earlier the vision of the right eye had begun to diminish and the eye had become more prominent. There had been no pain. There was slight ptosis of the upper lid, but the ocular movements were not limited except upward. There was moderate optic neuritis, and vision was $1/6$. The patient disappeared for nearly four years, at the end of which time the exophthalmos had enormously increased, the eye was luxated down and out, and there was no upward excursion of the eyeball, although the optic neuritis did not appear to have increased, and corrected vision was $1/4$. Between the eyeball and the roof of the orbit was to be felt a tumor of smooth surface, adherent to the bone. This was operated upon through an incision along the upper orbital margin. A free opening into the cyst gave vent to a large quantity of a

pasty yellowish substance containing coarse and fine hairs. Palpation of the cavity of the cyst disclosed a groove in the frontal bone large enough to admit the middle finger, and extending backward to near the position of the sphenoidal fissure. The wall of the cyst was inserted into the borders of this groove. The cyst was curetted, healing was perfect, and thirteen days after the operation the exophthalmos had completely disappeared, and the movements of the eye were normal.

A New Operation for Pterygium.

URIBE Y TRONCOSO, M., Mexico (*Anales de Oftalmologia*, April, 1914), for the past two years, has employed with very satisfactory results an operative procedure based upon the autoplasmic method; and which has shown itself freer than any other method from liability to relapse.

The head of the pterygium is separated in the usual way from the surface of the cornea, taking care to carry the dissection to the sclera, especially at the margins of the pterygium, in an extent of two or three millimeters. The denuded corneal and scleral surfaces and their margins are curetted with a sharp spoon curette. The apex of the pterygium is then held with forceps in its original position on the cornea. With fine scissors the head of the pterygium is cut off along a line parallel with and just outside the corneal limbus. The retraction of the remaining tissue produces a semicircular loss of substance with its concavity towards the cornea. From the nasal border of this area two incisions are carried, to include both the conjunctiva and the episcleral tissue. One of these (a), two or three millimeters long, according to the defect which it is desired to cover, runs upward at about forty-five degrees from the nasal margin of the defect towards the inner canthus. The second incision (b) begins at the end of the first and runs upward and moderately outward, so as to make the resulting flap broader at its base above than at the side corresponding to incision (a). The flap with its episcleral tissue is then dissected free from the sclera back to its base. The side of the flap corresponding to incision (a) is now brought down to the lower edge of the defect left by the partial excision of the pterygium, and the edges of the flap are fixed with sutures.

Intraocular Foreign Bodies.

LANDOLT, MARC, Paris (*Archivos de Oftalmologia*, May, 1914). Two cases are cited, in one of which, after a period of delay, during which the eye had been subject to slight inflammatory attacks, enucleation became necessary, following an unsuccessful attempt at magnet extraction; while in the second case suppuration rapidly followed the original injury, making removal of the eye imperative. The author urges that all eyes in which a foreign body is retained will sooner or later require enucleation.

Preventive and Curative Treatment of Iris Prolapse From Cataract Operations.

AGUILERA, GUILLERMO SANCHEZ, Granada (*Archivos de Oftalmologia*, May, 1914). In a young woman a small corneal incision for the extraction of a soft cataract was immediately followed by a hernia of the iris which widely separated the lips of the corneal wound. Attempts at replacement with the spatula had to be desisted from because of the imminent danger of vitreous prolapse. A few drops of eserine solution were instilled, and the eye was left bandaged for four days, at the end of which time it was in excellent condition, with the hernia reduced and the lips of the corneal wound in perfect coaptation. As a curative measure in cases of postoperative prolapse, Aguilera has used prolonged bandaging, kept up for one or two months, and changed every few days for instillation of two or three drops of a weak solution of salicylate of eserine (1/500) or of nitrate of pilocarpine (1/100). This treatment was successful in every case, with the exception of a restless patient with a convulsive palpebral tic, who would not consent to continuation of the bandaging for more than two weeks.

Some Ocular Complications of Diabetes Mellitus, Especially Changes in Refraction.

ALVARADO, EMILIO, Valladolid (*Archivos de Oftalmologia*, June, 1914). Various cases are cited in which ocular change or disease accompanied diabetes. In so-called diabetic cataract, or senile cataract in the diabetic patient, the author does not hesitate to perform the operation of extraction. None of his patients has failed to recover vision, and none has suf-

ferred from serious operative or postoperative accidents. The operation is always preceded by antidiabetic treatment and regimen. Other conditions referred to include diabetic iritis and glaucoma, diabetic ophthalmitis, and changes of refraction in diabetics. A review of cases of diabetic myopia from the literature is followed by relation of several personal cases; and a like review concerning diabetic hyperopia precedes a report of one personal case of this condition. In this patient there was also present a slight convergent strabismus, and at the same time there were some disturbances of mentality (obnubilation and slowness in the conception of ideas). With the disappearance of sugar from the urine the diplopia ceased and the patient no longer used his 2 D. plus spheres.

The essay is accompanied by a bibliographic list of forty-nine references.

Some Cases of Congenital Cataract.

VERDEREAU, L. (*Archivos de Oftalmologia*, June, 1914). Six cases of congenital cataract are briefly described. In every one of them the hereditary factor was completely lacking, no other member of the family presenting the same affection. In one case, that of an infant thirteen days old, the weight and size of the child, and lack of complete development of the eyes (fairly marked microphthalmus), seemed to point to arrest of uterine development; but, on the other hand, the baby was born with five teeth. In another case, two days after birth there were noticed slight change in color of the iris, and deformity and immobility of the pupil. There was thus an adhesive inflammation of the iris, which led to seclusion of the pupil and opacity of the lens. The author points out that these changes might have occurred in utero, and might have caused opacity of the lens without any synechia. In this case it would have been a mistake to speak of hereditary causation.

ABSTRACTS FROM ITALIAN OPHTHALMIC LITERATURE.

BY

J. HERBERT CLAIBORNE, M. D.,

NEW YORK.

On Complete Reconstruction of the Lid by the Method of Circincione.

CARRUCCIO, A. (*La Clinica Oculistica di Roma*, January and February, 1914). The reconstruction of an entire lid destroyed by accidental trauma, or, as more frequently happens, by the surgical removal of a malignant neoplasm, forms one of the most delicate and difficult feats of plastic surgery that can be presented to the clinician.

As a rule there is left some part of the free margin and the conjunctiva upon which a cutaneous graft, free, or preferably pedunculated, may be grown.

To solve this most difficult problem in the surgery of the lid, different operative procedures have been suggested, thought out, and placed in practice, and it is the intention of the author to briefly refer to the methods employed in his clinic.

After referring to the preantiseptic period in surgery, when failure was common by reason of suppuration of the graft, he proceeds to make some historic references to some who have attempted this difficult task, and refers to the methods of Gradenigo, Landolt, Kalt, Valudes, Ulrichs, Uhthoff, Eversbusch, Mueller, Birch-Hirschfeld, and Meisner.

He refers to the experiments made by Prof. Calderaro, who took his grafts from the skin and mucous membrane of the lip, and cites a case in which he applied a graft taken from the ear.

The case was that of a woman of sixty years, who had on her right upper lid a tumor the size of a beechnut, involving the inner two-thirds of the tarsus, but falling short of the margin. The skin over it was normal and movable. An incision extending the length of the lid was made over the tumor, and the entire neoplasm, the tarsus and conjunctiva for one and a half centimeters was removed, leaving a small

portion one-half centimeter in length toward the external canthus. The orbicularis with the lash margin was left.

To repair this loss of substance in the tarsus and conjunctiva, Prof. Calderaro thought of utilizing a flap taken from the outer surface of the concha of the ear, including at the same time a small piece of cartilage. The piece was about two centimeters in length, one centimeter in height, and was adjusted to the fenestra, the extreme points being fixed with several sutures applied to the free margin of the lid, and the residual conjunctiva toward the canthi.

On the third day the sutures were removed, and on the eighth day it looked pink and well nourished. On the tenth day there was lively ciliary injection with marked pain, and a small loss of substance was observed, along with infiltration at the upper corneal margin, which went on to assume the characteristics of a grave ulcer. On the fifteenth day the graft came away, leaving the surface raw.

On examination the piece was found to contain a number of fine hairs, which caused the ulceration. Subsequently a graft taken from the lip of the same patient was used. This held, and the case finally recovered with only a slight entropion which gave no further trouble to the patient.

The author cites this case to show that grafts taken from the ear are not satisfactory, and proceeds to describe the methods of Cirincione, which he claims fill all requirements, and by which he grafts a pedunculated cutaneous flap upon that part of the conjunctiva which remains.

The author describes several cases of Cirincione, but it is not worth while to formulate his methods exactly.

This paper demonstrates mainly that it is practically impossible to take a graft from the ear for the purpose of reconstructing the lid, and the methods of Cirincione in general differ but slightly from those employed by many others, particularly Americans.

Histologic Observations and Histogenetic Reflections on a Case of Primary Epithelioma of the Cornea, With Ten Chromolithographic Plates.

ALESSANDER, F. (*La Clinica Oculistica*, March and April, 1914). This paper is a thorough, laborious and minute study of a case of primary epithelioma of the cornea, and is intended as a preliminary note to further investigation.

The case occurred in the clinic of Professor Scimemi. Unfortunately the patient was lost in the earthquake of Messina, but the author saved several microscopic specimens along with some drawings which are the basis of the study.

He refers to the literature of the subject as collected by Profeta. After noting the fact that such cases are very rare, that they develop in tissues surrounding the cornea and thence are transferred to it, he goes into a long and exhaustive description of the histology, making particular reference to the so-called epithelial pearls. This is followed by a learned dissertation on the origin of these tumors, and finally he draws the conclusion that eipthelioma of the cornea may be classified as primary—which was the problem he had set himself; likewise, that they consist essentially and principally in an abnormal exaggeration of the reproductive function of preexistent histologic elements; then he draws a parallel between this conclusion and the definition of inflammation set forth some years ago, viz., that inflammation consists in a general and irregular exaggeration of cellular function. Alongside of this cellular reproduction characteristic of these neoplasms, degeneration and death of cells are to be noted—a degeneration which is identical with that described by Robin, Thiersch and others, and which gives the true explanation of the relatively small number of these tumors; likewise of the occurrence of frequent hemorrhages in epithelioma and carcinoma.

Attached to this article are ten beautiful chromolithographs showing the pathologic changes in the case reported. Such work is worthy of the highest commendation, and it is to be regretted that it cannot be reproduced for the readers of the ANNALS.

Visual Disturbances Caused by the Action of the High Tension Electric Current.

MANZUTTO, Trieste (*La Clinica Oculistica*, March-April, 1914). Serious injuries to the eye due to the action of electric current are not very frequent, and for this reason the author considers it opportune to publish a case which he observed in his clinic.

A workman, twenty-four years old, while repairing an electric wire of five hundred volts, received a shock at eight o'clock on the morning of the 23rd of February, 1914, which

passed through his body. He was thrown two meters from where he was working, and was picked up by a fellow workman. After a while he came to himself and found he could see nothing around him, except he had the sensation of an intense light in which he seemed to be bathed. The color of the light was light yellow. He experienced likewise a deep burn on the right hand, lighter burns on the right side of the face, on the lids of his right eye, and on the right side of his nose, followed by the formation of blisters. His mustache, eyelashes and right brow were singed. The burns were cured with treatment. That evening the patient had a sensation of severe burning in both eyes with redness and a watery secretion—more on the right than on the left—for which drops were prescribed. The irritation of the eye continued for several days, but disappeared on the left side first. The day after the accident the patient began to see better on that side, and the improvement continued. In the right eye, however, the sensation of intense light continued the day after the accident, and finally terminated in almost complete darkness, so that the patient could recognize only large objects in the midst of a dense gray cloud. Immediately after the accident he commenced to have severe pains in his head and right eyeball, with a feeling of pressure which, little by little, diminished in intensity.

The patient was seen at the clinic on the 10th of March. At that time the burns of the hand, with several blisters not yet cured, were still present. The right side of his face, both lids of the right eye, right brow and the right side of his nose were still red. There was no lesion of the eye visible externally: ocular movements were free; pupil and iris normal; lens intact; no change in background of the eye. Vision, movements of the hand—consequently the field of vision could not be taken. The left eye was normal externally, likewise the background and vision were normal.

After complete rest and protection from light, the condition became better and better, so that on the 31st of March it was 6/60. There was, however, a slight concentric restriction of the field for white, likewise for colors. At the same time the vision of the left eye improved to 6/4, and the field was normal. On April 6th the vision of the right eye was about 6/12, and with that eye the patient could read Snelling No. 4. He

claimed that in looking at things, near by, objects trembled and words mixed with each other.

The lesions in the patient were undoubtedly due to the direct contact of his body with an electrical current of high tension, such as is used for the purpose of illumination, electric railways, etc. Immediately after the accident he lost consciousness, and as soon as he recovered his senses he noted a series of visual disturbances. It is probable that there was a fleeting paralysis of the optic nerve and the retina.

In general, lesions of the eye following an electrical shock are: Corneal changes in the shape of opacities more or less dense; alterations in the pupil: miosis or dilatation; congestion and irritation of the iris; opacities in the vitreous; accommodative disturbances, and especially more or less grave changes in the lens, terminating at times in complete cataract—at times, also, in detachment of the retina; and in some cases complete blindness has resulted, evidently owing to lesions of the central optic paths. As the cause of these various lesions, whether they be fleeting or permanent, the action of the electric current, along with the effect of the ultraviolet rays, must be recognized. The irritation of the external parts of the eye is especially due to the action of the ultraviolet rays: but in part, likewise, to the strong thermal action, as demonstrated in the burns of the skin, eyelashes, eyebrows, etc.

Since the ultraviolet rays are absorbed in part by the cornea and to a greater degree by the lens, their action upon the retina and the nerve appears to be less harmful, while there is reason to believe that the functional disturbances and retinal changes may be due to the luminous rays.

In regard to the final outcome, an improvement in the vision is probable, although the prognosis in such cases should be cautious, since, in many cases with mild symptoms, a certain amount of sensitiveness of the eye, with fear of light, weariness and asthenopic disturbances remain.

The pains in the head and supraorbital sensitiveness may persist for some time or continuously. Likewise, cataract may sometimes occur months after the lesion, even when visual disturbances have disappeared immediately following it; also, we must remember that there may arise in such cases a traumatic neurosis, with all its consequences to the patient himself or to his capacity for work.

SOCIETY PROCEEDINGS.

BY

ARTHUR J. EDELL, M. D.,

ALBANY.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

Regular meeting, held April 20, 1914. President Dr. Wesley Hamilton Peck in the chair.

Glaucoma Following Cataract Extraction.

Dr. M. H. Lebensohn: Mr. Geo. T., age fifty-three years, was admitted to the Illinois Charitable Eye and Ear Infirmary, June 15, 1913, with a history of failing vision in the left eye for nine or ten years, and the right eye for five years.

Diagnosis.—Right eye, immature cataract; left eye, mature senile cataract; pupil of left eye reacted normally; perception and projection good. On June 23d an iridectomy of left eye, about five to six millimeters wide, was performed, with little reaction following. July 15th, vision $1/200$, with a $+ 11.00 = 20/40$. There was a very thin capsule in the pupillary area. He was needled July 22d. July 25th, with a $+ 11.50$ he had vision of $20/20 + 2$ or 3 , and that was the lens prescribed for him. The tension came down, and the patient became comfortable again. About the end of November the tension was taken with a tonometer, and it varied from 29 to 40, at one time going as high as 44. Eserin sulphat and pilocarpin seemed to have little effect. February 2, 1914, the tension was $53\frac{1}{2}$ and a scleral trephining was done below, and a peripheral iridectomy. Twenty-four hours after, there was a moderate ciliary injection and the wound drained nicely. February 6th, ciliary injection almost entirely gone, wound well drained and no pain. February 14th, vision in left eye $20/40$. February 18th the patient could not see the electric lights in his room, and vision was reduced to finger at about ten inches. Examination showed large brownish mass in upper temporal

side. Diagnosis was made of detached choroid. The patient was put to bed, eye bandaged, light diet ordered and dionin used in eye. There was no pain, and after ten days the re-attachment was complete, with vision of 20/30. In two weeks it was 20/20 + 3, and now it is about 20/15, with tension normal.

Dr. Lebensohn said it would be interesting to have statistics of cases of trephining without iridectomy so as to know whether detachment ever follows that operation.

Eye Diseases and Autointoxication.

Dr. Clark W. Hawley stated that many eye diseases are cleared up by urinalysis showing that the system is absorbing toxins from the lower bowel, whence they are absorbed into the circulation. The uveal tract of the eye, on account of its exceeding vascularity, is a very good stopping point for any wandering toxic material, and thus we have iritis, cyclitis, choroiditis and other inflammatory manifestations.

The diagnosis is made through a very careful analysis, there being two main abnormal conditions which must be taken into consideration: first, acidemia, and, second, evidence of poisonous extractives present, as indican, indol and skatol.

The treatment consists in a most thorough cleaning out of the lower bowel at regular intervals. For flushing out the lower bowel uses three pints to two quarts of water at 110°, and in some cases a second flushing immediately follows with the temperature at 120°. A tablespoonful of salt is added each time, and the time allowed should be from ten minutes to a half hour. Place the patient in a knee chest position. Treat the acidemia with some form of alkali and regulate amount of water taken. As to medicine, use some form of iodine along with cathartics.

Dr. Hawley reported the case of Mrs. M., May 5, 1913, who complained that her glasses needed changing. The vision of the right eye was 6/18 and the left eye 6/12, no glasses improving the vision. On examination choroidal disease about the macula was discovered. The most painstaking care on the part of the patient in following instructions resulted in a very satisfactory improvement. The charts exhibited by Dr. Hawley showed an increase in amount of urine passed, a decrease in specific gravity and acidity. By October 6th all the con-

ditions were vastly improved, which continued until February 25th, when the extractives appeared again, due to a partial meat diet. The choroidal disease was arrested and the vision improved two lines. The mental and general bodily condition have also markedly improved.

Dr. M. had had recurring attacks of iritis, an analysis of his urine showing high acidemia and indican present. Dr. Hawley at once put him on the proper diet and treatment, since which time he has had but one attack, and that brought on by not following the prescribed diet.

Dr. Hawley stated that in 1910 he was suffering from apparent chronic cyclitis. A urinalysis disclosed a severe case of autointoxication. After treatment for two months the opacities in his eyes, from which he had suffered, had nearly disappeared. The uveal tract, when once involved, is very sensitive, as is evidenced by the fact that the opacities reappeared after Dr. Hawley had been eating cheese at meals for about a month. After discontinuing the cheese the opacities disappeared after two months. The same old opacities appeared after eating a moderate proteid diet for two months, another evidence that the rule must be followed. He again began treatment, and at this time the opacities are hardly perceptible.

Dr. Hawley said that it had been stated that constipation is caused by bowel flushing, but his experience had disproved this as to himself and a number of patients. One patient's severe constipation was entirely removed.

In concluding, Dr. Hawley stated that in every case where he had suspected autointoxication to be the cause of the eye symptoms, with the cooperation of the patient success had followed the treatment, and he felt sure that autointoxication explains many indefinite symptoms of eye strain.

Discussion.—Dr. Brawley stated that the author of the paper claimed to do entirely without proteids. He did not see how it could be managed, for while he could do without animal proteids, it would not be easy to get along without the proteid in the wheat germ. Only in rare instances is it necessary, in the judgment of the speaker, to do without proteids. We are able in many cases to gradually increase the tolerance of the patient for proteids by giving very small amounts of the more digestible types.

In consultation with internists who are familiar with cases of this kind, they are found unanimous in their opposition to this constant flushing of the bowels. For immediate necessity it is invaluable, but it is claimed that it interferes later with the function of the colon and constipation may result. They prefer to use it as a temporary expedient, to be followed later on by the coarser brans and fruit, or vibratory stimulation without any fluctuation whatever may empty the bowels: also vibration over the lumbar area of the spine. In that way it is claimed that they break up the scybala and what they call the tunnel mass. This is broken by vibratory stimulation.

In closing the discussion Dr. Hawley stated that he had thoroughly agreed with everything that Dr. Brawley had said. He was desirous of shortening his paper and did not care to extend it along certain lines more than could be helped. He disagreed with one statement made by him in regard to bowel flushings. Patients who have followed instructions have been cured of constipation. If the flushing is carried out with hot water and salt along with a mild cathartic and some form of iodine, constipation is not likely to be produced. Dr. Hawley said that an internist had told him he was doing a very bad thing, that he would have a case of constipation, and he thought so himself, but at the end of eight months he was cured of constipation. Internists do not know much about it, and their success is not great. There are several forms of proteids. Fermentation in the lower bowel is nothing more nor less than bacterial disease. The effect of the vegetable proteids is considerably different from the animal proteids, and he referred to the animal proteid. Of course, there is a good deal to be learned, and possibly we may change our opinion, but so far the speaker attributed his success to this one fact.

Prognosis in Eye Injuries.

Dr. Richard J. Tivnen read a paper on the above subject, prefacing it by bringing out the close relation between diagnosis and prognosis in injuries of the eye. He emphasized particularly the necessity of gaining a complete history of the case in order to decide upon the best method of procedure, and suggested that as only a brief inspection of the eye is usually possible, especially with children, the routine observance of the following working details will give satisfactory results:

First.—The position of the patient during the examination; suggested a recumbent position.

Second.—Good illumination.

Third.—Specific instruction to the assistants.

Fourth.—Arrangement of a dressing table with reference to quick action.

Fifth.—Use of local anesthetic.

In addition to the foregoing, he urged the necessity of blood examination and Wassermann tests, smears and cultures from wounds and ulcers, urinalysis, both chemical and microscopic, testing of visual acuity, and the making of skiagraphs—two at least.

Dr. Tivnen selected for especial consideration two types of injuries, viz.: Foreign bodies in the cornea, and ulcers resulting from such trauma. In the case of the removal of a foreign body from the cornea, he emphasized the necessity of protecting the cornea until the healing is complete, as a large majority of corneal ulcers are the result of foreign bodies inflicting injury. Patients suffering with corneal ulcers should not be allowed to make daily visits to the physician's office nor be permitted to engage in their regular occupations.

In the matter of injuries, a number of factors determine the tolerance of the eye to the foreign body: Infection; the chemical character of the substance introduced, glass being best tolerated by the ocular tissues, since it excites no chemical change. Copper is particularly dangerous. A number of instances were cited illustrating the tolerance of the eye to retained foreign bodies, one which proved that a foreign body may be in the sclera for five years without occasioning difficulty. However, such instances are rare, and this tolerance cannot be construed as a dependable or certain element.

In the matter of perforating injuries of the globe, the ophthalmologist is always face to face with the danger of the development of a sympathetic process in the sound eye, and it presents no well-defined symptoms of its incipient development or any dependable diagnostic measures which herald its approach. Once a sympathetic process is established it is next to impossible to stop its progress short of destruction of the eye. When light perception is lost, tension becoming gradually reduced and evidences of inflammatory reaction are present, the globe should be removed without delay. The plastic clos-

ure of the lymph spaces and vessel, it is now declared, does not absolutely protect against the subsequent development of a sympathetic process.

Injuries from electric flashes, although presenting great external evidence of severity, have been proven by experience to be of rather a temporary character; in one case where the patient complained of inability to see and intense pain in and around the eyes, together with swelling, vision returned to normal within twenty-four hours, and after a period of two weeks the reaction of lids and globe had subsided, with no impairment whatever.

Dr. Tivnen issued a word of warning in regard to the too ready assurance of the surgeon that the needling operation in cataract is entirely void of danger. This operation is not one of perfect safety, as is sometimes assumed.

Discussion.—Dr. Clark W. Hawley said that there was little left for discussion, as the paper was so thorough. His experience had been very similar to the author's, and one of his greatest difficulties had been to get the patient to appreciate the seriousness of the situation. He had always hoped for some way to combat sympathetic ophthalmia. A charming result was obtained by a quack in Salt Lake City by the injection into the vitreous of the eye of a considerable quantity of 1/500 bichlorid of mercury. The pain was intense, but the eye was saved and so was the other.

The remarks in the paper concerning the X-ray are very pertinent; but in one case both the magnet and X-ray failed to locate a tiny piece of steel, which was found by careful examination. It is surprising to see how tolerant the eye becomes to foreign bodies. Dr. Hawley cited a case where a piece of steel had been in the eye for a year and six months, it being very small and having entered the cornea and ciliary body. A member of the ophthalmological society at that time—twenty years ago—said that removal would cause the loss of the eye, but he removed the steel and the man has 20/20 vision.

Dr. A. L. Adams stated that he was impressed with Dr. Tivnen's advice to have an X-ray examination in cases of doubt as to the presence of foreign bodies in the eye. He cited a case where the attending physician diagnosed contusion of the eye, and he was unable to find any evidence of penetrating injury, as he was unable to make an examination of the fundus

of the eye. In this case the X-ray cleared up the matter immediately, and a foreign body was shown lodged just posterior to the eye, in the optic nerve. The foreign body penetrated the lid in a transverse way, so that the wound had closed and was unnoticed. In doubtful cases you get much information from the use of the X-ray, even though there is no suspicion of a foreign body being in the eye.

Dr. Carl B. Wilkin was pleased to hear the statement made as to not placing too much reliance upon the word of the patient as to a foreign body being in the eye. In a recent case a patient had stated that he felt something strike his eye. On examination a foreign body could be seen in the retina, but with a magnifying glass no point of entry could be seen. In twelve hours the media was so opaque that the fundus could not be seen. A spiral incision was made and the body removed. The procedure should be: First, the ophthalmoscope; second, the X-ray, and then the exact localization by means of the X-ray.

Dr. M. H. Lebensohn said that in the prognosis of disease it is well to remember the resistance of the patient. A man who was blasting on the railroad got a foreign body in his eye, and after several weeks the X-ray showed the steel, which looked like a cap. After it was extracted it proved to be nothing but a small piece of exudate. The man made a healthy recovery.

Another case was a man who had a piece of steel in his eye six weeks. It was located in the lens, and a cataract was taken out at the same time. The lens was extracted, and that same evening he was walking around in the basement smoking a cigar. This was due to nothing but the man's great resistance.

Dr. Lebensohn strongly recommended the use of cyanid of mercury in sympathetic ophthalmia. In a recent case the eyesight had not been saved altogether, but the vision had been improved.

Dr. Tivnen, in closing the discussion, stated that he was glad that the speakers were unanimous regarding the accepting of the patient's word. In a recent case where there was no evidence of an entrance wound the fluorescent test was used, and the patient about to be dismissed. Before dismissing him, however, a drop of cocain was dropped into his eye, and he

was taken into the dark room. This was done without any apparent reason, but the result was amazing, as a piece of steel was laying on the retina.

The type of cases that give us the most worry are those of perforating injuries of the eye, with no foreign body in the eye, and the patient declines to have the globe enucleated. It is easy in the case of a woman or young child to allow ourselves to be influenced. If we will read Fuchs' article we will obtain the method of procedure definitely and positively, and any variation is apt to result disastrously. His dictum is perception, projection test and also tension of the eye. When they fail, do not wait any longer.

A good work for this society would be to teach the radiographers to specialize in their work. For instance, we might concentrate upon two or three men in this city who will give the time and acquire the necessary equipment to localize these foreign bodies, occasionally bringing them here, perhaps, to demonstrate their plates.

On motion of the secretary the president appointed a committee of three, consisting of Drs. Tivnen, Lamothe and Nance, to investigate the nature of the contents of golf balls.

The Modern Therapy of Pneumococcus Infections of the Eye.

Dr. Harry S. Gradle stated that in the past our ideas of virulence had been gained by animal experimentation, but it has been recently shown that the pneumococcus in a twenty-four hour culture will assume one of three types: First type, small, delicate, lanceolate pneumococcus; it is very virulent. The second type forms the larger diplococcus, somewhat more rounded; this is not so virulent, and is a more common type. The third type grows very luxuriantly, and is not so highly virulent; in a culture it would be taken for a true streptococcus.

The new drug, ethylhydrocuprein is an absolute specific against the true pneumococcus in every respect. It has not a great penetrative power, and we cannot use the drug in closed cavities because it is highly toxic. It is very soluble in water, and as it is irritating should be preceded by a cocain anesthetic. The use of this drug in pneumococcic infections of the eye will cause them to disappear in two or three days. In the pneumococcic infections of the tear sac the treatment depends upon whether the condition is accompanied by stenosis. If not, we

can syringe out the passages with a one per cent solution of ethylhydrocuprein, and get rid of the condition in a short time. Our most important advances in the line of pneumococcic affections of the eye have been made in serpiginous ulcers.

Wessely's steam cautery is a small instrument with two tubes going through it, one solid metal tube being kept at a temperature of 100 degrees centigrade. With that the anesthetized cornea is massaged for a period of three minutes. Too short use of this instrument is dangerous, as it only numbs the organ. The steam must have a chance to kill the organisms. In severe cases we must resort to the steam cautery. In the intraocular affections there is no advance in the therapy. We can influence those cases to a degree by the use of urotropin if we start early enough, and it is also good as a prophylactic agent.

PAUL GUILFORD,
Secretary.

JOINT MEETING OF THE CHICAGO MEDICAL SOCIETY AND CHICAGO OPHTHALMOLOGICAL SOCIETY.

Held May 13, 1914.

DR. W. H. PECK, PRESIDENT OF THE CHICAGO OPHTHALMOLOGICAL SOCIETY, IN THE CHAIR.

SYMPOSIUM ON THE PREVENTION OF BLINDNESS.

Conservation of Vision.

Dr. Frank Allport read a paper on Conservation of Vision, in which he said that societies for the conservation of vision have been formed in various portions of the United States. The membership in some is medical, and in others both lay and medical. In Pennsylvania, Indiana, Missouri, etc., the organization exists as a committee of the state medical society; in New York, Illinois, etc., independent associations have been formed; in Ohio the "commission," as it is called, is a part of the state government. There is also a national association, independent in its nature, and mixed in its membership. Some of these associations, such as New York, Massachusetts, Maryland, Ohio, etc., are doing energetic work, while others are inactive and almost useless.

At the 1913 meeting of the American Medical Association the Council on Health and Public Instruction appointed a committee on Conservation of Vision, of which the speaker was appointed chairman. The object of this committee was to create interest and action in conserving vision, and endeavor to concentrate under the auspices of the American Medical Association activities calculated to preserve the sight of this and coming generations. The work of this committee began by utilizing the machinery of the association. The Council on Health and Public Instruction sends each week a sheet called the Press Bulletin, consisting of short, plainly written unsigned articles on health topics, to nearly six thousand newspapers, used by the papers as editorials, news matter, etc. The Council also employs clipping bureaus, and through them it is ascertained that these articles are very extensively used and are shaping public thought along med-

ical lines in this country. The Committee on Conservation of Vision has an appropriate article in the Bulletin each week, and it is felt that this is a most important part of its work, as it reaches so many people and is under direct control.

The next work of the committee was to write, print and circulate twenty small pamphlets on popular eye topics signed by authors. They also are well illustrated. They are for sale at five cents a copy, but are also freely given away on proper application. Sets of these pamphlets have been sent to public libraries, women's clubs, teachers' institutes, state legislatures, health boards, etc., all over the United States.

Next, it seemed desirable to the committee to create a national sentiment in favor of conservation of vision, and for this purpose it was determined that lectures on this subject should be delivered in each state. A lecture bureau manager was appointed in each state, who was willing to superintend the work in his state. Where a state organization for conservation of vision existed, one of its officers was selected to carry on the work, but where there was no such organization, a prominent, energetic and willing oculist was selected. The "State Manager," as he was called, was to enlist the assistance of all the oculists he could, acting, wherever possible, in harmony with local and state medical societies, both ophthalmologic and general. Prominent and energetic oculists were to be found to give lectures on the conservation of vision, such lecturers to reside in different portions of the state, so that long and expensive journeys should not be necessary. The State Manager corresponded with local medical societies, women's clubs, teachers' institutes, boards of health and education, etc., and arranged for these lectures by invitation. The expenses of the lecturer were to be paid, if possible, by the organization issuing the invitation. The lectures were to last about one hour, and were to be given in plain and unscientific language, with a discussion following. In order to make these lectures easy to deliver, the committee prepared a box of about thirty colored and uncolored stereopticon slides and sent them to each State Manager, to be loaned to his associates in the work whenever a lecture was to be delivered. In addition to this a pamphlet was prepared, entitled "A Plan of Campaign for the Conservation of Vision." This pamphlet contained a full description of the plan, and what it was proposed to ac-

compleish. A kind of skeleton lecture was included in it, suggesting subjects, etc., to be referred to in lecturing. These pamphlets were freely dispensed to all State Managers, who distributed them to their associates in the work. Each lecturer was also placed on the mailing list for the Press Bulletin, and also received a complete set of the "Conservation of Vision Pamphlets." Quantities of the Vision Charts for Schools were also sent into each state. While these lectures were intended to cover all avenues of vision conservation, it was especially hoped that it would result in the use of the Crede treatment of the eyes in all newborn babes; in the lessening of shop accidents; and in the annual and systematic examination of all school children's eyes by school teachers; for it is reasonably certain that if these three procedures could be universally adopted, eighty per cent of all blindness could be eliminated from this country. The establishment of measures referred to above could be accomplished at an annual cost which would not exceed \$250,000. It costs \$15,000,000 a year to care for the dependent blind in this country alone.

Emphasis should be laid on several points connected with the annual systematic examinations of school children's eyes, etc., by school teachers.

First, the examinations are simple and require no medical education.

Second, teachers are not expected to make diagnoses. They merely ascertain the fact through the questions that something is wrong, and leave the rest to the doctor selected by the family for consultation.

Third, a child can be easily examined in five minutes, and each teacher should examine the children attending her own room. By subdividing the work in this way, all the children in any city of any size can be easily examined in one day—a definite day in the early fall of each year should be set aside for these tests in all cities.

Fourth, these tests not only benefit the children by leading to the correction of their eye defects, but benefits the teachers, because such corrections usually add materially to the intellectual and moral character of the children, thus rendering them much easier to teach and more pliable to discipline. Teachers should, therefore, be glad to do this work.

Fifth, there is no objection to these examinations being made by doctors or school nurses. This, however, would cost large sums of money, and boards of education and health are never allowed enough money for even ordinary purposes. This is a fact which might as well be frankly recognized and acted upon. The teachers are capable of doing it, and it takes no extra time. It is a benefit to themselves as well as to the children. It costs practically nothing; therefore, let it be done in this way.

The question may be pertinently asked: "What has been the result of the state lectures?" This has varied greatly in different states. The State Managers accepted the work voluntarily, after the ideals were thoroughly explained. After a promise of conscientious work was given, the box of slides and printed matter were sent, representing an outlay of about twenty-five dollars for each state. In some states this ended the matter, and so far as the chairman of the committee knows, no work whatever has been done in some states, no lectures delivered, and nothing accomplished. Letters have remained unanswered, and appeals unheeded. This has, therefore, been rather discouraging. In other states the work, for one reason or another, has been delayed, but still something has been done; as many lecture engagements have been made for next fall. But, the speaker was glad to say, in most of the states honest, conscientious work has been accomplished, and excellent results achieved. The results are, of course, not all that could be desired, but still, considering that this is the first year of the committee's existence, Dr. Allport felt that he should be very grateful to those gentlemen who have given this project their time, their labor and their means.

As to the future of the work, he would recommend:

1. The continuance of a weekly article on the eye for the Press Bulletin of the Council on Health and Public Instruction.

2. A few more Conservation of Vision pamphlets on interesting subjects and the increased circulation of these pamphlets.

3. The continuation of the Conservation of Vision lectures in the various states. Many more of these lectures should be delivered, and the State Managers should be changed, where the present managers have not shown a reasonable

interest in the work. From twenty to twenty-five new slides for the stereopticon should be made, that will more fully illustrate the subject.

4. The seaker was at first in favor of encouraging the formation of state societies of the conservation of vision, these societies to possess complete self-government, but all of them to declare themselves in affiliation with the committee on Conservation of Vision of the Council on Health and Public Instruction of the American Medical Association, by a slender thread of connection. He was also in favor of asking those states already possessing state organizations to join with the committee in the same sort of affiliation. Also of proposing an annual meeting of this affiliated organization, and the formation of a national body of this nature for the conservation of vision. But time and experience have considerably modified his views, and he now believes that other plans are better.

First, there is already a national society of this nature. It is, it is true, highly inactive, but still it exists and should, he believes, be encouraged to an awakening activity.

Second, local conditions in many of the states are not conducive to friendly assistance. However well meant, it is in some states regarded as meddlesome interference, as an effort to rob existing organizations—whether active or lethargic—of some credit, which it is felt should remain with the local organization, and not be shared with even a well-intending interloper. These views are but natural to those people who have worked hard to develop a praiseworthy state society. They want the credit for their work, and should have it, and he believes it is better that they should be let alone, and not asked to merge their identity or work with that of another organization. His recommendation, therefore, for the future is that this committee shall do what it can to inspire the formation of State Conservation of Vision organizations, either as independent medical and lay societies, or as commissions of the state governments. It should stand ready to advise and assist such work in any possible manner, but it should not suggest a formal connection of any description with the committee of the American Medical Association. This committee should also be equally ready to advise or assist state organizations that already exist, and should cooperate with them in any way they may properly request.

He would also recommend that the work of the committee be extended, so that it shall become a potent power in the community. It should have a central office, with a paid, interested, intelligent, energetic secretary, who could and would from time to time journey from state to state, upon request, and assist in the formation and perpetuation of state societies for the conservation of vision. His traveling expenses should be paid by those who summon him to the various localities. He should have a well equipped office, with one or two stenographers, and a library and files, containing everything that is printed on the subject of conservation of vision. This office should be recognized as a central bureau of assistance, advice, literature, laws, etc., where all questions concerning this subject can and will be intelligently and willingly answered. The work of such an office would be enormous and its influence widespread. But to do this considerable money would be absolutely necessary, and he would, therefore, recommend that this money should be forthcoming from some source, and that the good work be encouraged to go on. He would also advise the distribution in all schools of crisply and plainly written leaflets concerning the care of eyes, ears, noses and throats. These should be taken home, so that the parents could read them. They should be printed in various languages. Perhaps even a better plan would be to have suggestions of this kind printed on the blank fly-leaf of all school books. This would cost almost nothing extra, and the benefits to be derived would be incalculable.

Blindness Due to Ophthalmia Neonatorum—Its Cause and Prevention.

Dr. Richard J. Tivnen then gave a talk on "Blindness Due to Ophthalmia Neonatorum—Its Cause and Prevention," which was illustrated by stereopticon slides.

An extended review of the subject was given and numerous tables shown illustrating the prevalence of ophthalmia neonatorum, the proportion of the disease in relation to blindness from all causes, and the proportion of blindness caused by ophthalmia neonatorum. From these conclusions were drawn that one-eighth of blindness from all causes is due to this disease, and one-fourth of the blindness among children is attributable to the same cause.

A comparison of the cases of ophthalmia neonatorum to all diseases of the eye showed:

1. Illinois Charitable Eye and Ear Infirmary,
Chicago1.30%
2. Massachusetts Charitable Eye and Ear Infir-
mary, Boston.....1.04%
3. Manhattan Eye, Ear and Throat Hospital, New
York0.3 %
4. New York Eye and Ear Infirmary, New York..0.08%

A comparative table showing blindness caused by ophthalmia neonatorum showed:

	Cases.	Per Cent.
Magnus' Table.—Of 2,528 cases of blindness in Germany, ophthalmia neonatorum caused blindness in	275	10.876 %
Trousseau's Table.—Of 625 cases of blindness in France, ophthalmia neonatorum caused blindness in	29	4.60
Oppenheimer's Table.—Of 572 cases of blind- ness in the United States, ophthalmia neonatorum caused blindness in.....	18	3.10

The census returns from England and Wales (1901) showed one-third of the cases of "blind from childhood" were blinded by ophthalmia neonatorum, approximately 1500. Causes of blindness in London school children (based on 362 cases) showed ophthalmia neonatorum to be the most frequent cause of blindness, with a percentage of 36.36. Other statistics gathered by various workers showing percentage of blindness produced by ophthalmia neonatorum are as follows:

	Per Cent.
Reinhard { Germany, Austria, } { Denmark, Holland }	40
Claisse Paris	46
Magnus Breslau	34
Katz Berlin	41

The "Special Reports on the Blind and Deaf (1901), United States Census" showed 2,556 lost sight after birth, but under one year of age, and in 644, or 25.2 per cent, of these cases the cause of blindness was probably ophthalmia neonatorum.

The New York Association for the Blind, in a pamphlet on this subject, states: "The official census of New York state (year 1906) gives a total of 6200 blind persons in the state. Ten per cent of the blindness (or 620 blind persons) was due to ophthalmia neonatorum."

The same observers present tables from eleven schools of

the blind throughout the United States and Ontario, showing the proportion of children admitted during the year 1907 who had lost their sight from ophthalmia neonatorum. These percentages show a maximum of 50 per cent and a minimum of 12.50 per cent of cases who had lost their sight from this disease.

A reference to the activity of midwives and obstetric practice showed that "in Chicago, in 1904, 86 per cent of all births, principally among Italians, were reported by midwives. In Buffalo, nearly one-half of the births, in one year, were attended by midwives. In New York City, in 1905, 43,834 births, or 42 per cent of the whole number, were attended by midwives. For the year 1907, in New York City, there were 68,186 births reported by physicians, and 52,536 reported by midwives. In September, 1908, the registered midwives in the five boroughs of New York City numbered 1,382."

The author of these reports well concludes: "In the face of these figures, it is idle to talk of the elimination of the midwife."

The essayist touched on the economic side of the question, stating that it costs the state \$3,000 to educate a blind child, and referring also in this connection to the cost of the equipment and maintenance of blind schools and the loss in the earning capacity of the individual and the curtailing of "avenues of opportunity" which the blindness imposes.

A consideration of the etiology, pathology, and clinical course and treatment of the disease was presented and a plea made for a more general use of Credé's method of prophylaxis. The essayist also made known the plan which the committee of the Chicago Ophthalmological Society is inaugurating to aid in the prevention of infections due to ophthalmia neonatorum. In brief, it was the plan described by the New York Association for the Blind and was designed to follow three general lines: 1. Educational. 2. Legislative. 3. Co-operative.

Educational.—Through the preparation, publication and dissemination of printed matter, emanating from the committee or approved by it; through public lectures, addresses and exhibits; and by means of the press—upon whose generous assistance the committee greatly relies.

The object sought is to spread among the general public the

knowledge that infant ophthalmia is a dangerous, infectious disease, fatal to sight unless checked at the time of the birth of the child, easily preventable then if simple precautions are taken; to inform parents, more especially, of the dangers which threaten the sight of their children at birth, and the preventive measures which should be taken; and to advocate the universal adoption of such measures.

Legislation.—To promote such legislation as may be needed to accomplish the object in view—the prevention of the unnecessary blindness of infants.

Cooperation.—In furtherance of the same object, the committee seeks and invites cooperation with medical societies, health officers, ophthalmic, maternity and other hospitals in which children are born; dispensaries, city missions, settlements; with schools, institutions and associations for the blind, and with all societies engaged in work for children and for social betterment; with district visiting nurses, and with all persons who are already engaged in this work or who desire to help in it.

The Cost of Blindness to the State.

Dr. Thomas Woodruff said that much of the blindness of the world is due to causes that are easily preventable. The cost of prevention is small compared with the amount needed to educate and care for those who have been deprived of sight. Any individual who has his sight destroyed has his earning power absolutely taken from him. He must become dependent upon outside aid for his future maintenance, and the community loses an asset consequent upon his withdrawal from productive activity. If the blindness occurs in early childhood, the greater the cost to the state. The blind child must be educated in schools specially provided, special teachers are required, and the cost is proportionately higher than in schools where the seeing child receives instruction.

It costs the State of Illinois over three hundred dollars a year for the maintenance of each blind person under its care. That is, the State of Illinois pays out approximately \$100,000 a year for the education and maintenance of the blind under its immediate care.

The cost of maintenance, to the United States, of the dependent blind is about \$10,000, per capita, through life. It

costs this country \$25,000,000 a year in taking care of the blind. Then there is the matter of unemployment and reduced earning capacity. The average wage of those of the blind men who are employed is \$7.00 a week; that of the women, about \$3.00 a week. There is no definite data as to the number of blind employed.

Now, as to the cost of preventing unnecessary blindness, and a conservative estimate places the number of cases of preventable blindness at about forty per cent of the total number. The cost to the community consists of cost of treatment at the onset of the disease; cost of educating the blind; and cost of maintenance, and added to this is the loss occasioned by unemployment as well as reduced earning capacity of the one afflicted.

The cost of treatment is difficult to estimate, as can readily be seen, but this is the smallest item.

As to cost of prevention, let us take the most frequent and most potent cause, as well as the most preventable and most unnecessary form of blindness—ophthalmia neonatorum.

A one per cent solution of nitrate of silver instilled into the eye at birth is a sure preventive. Nitrate of silver is cheap; add to it the cost of containers and expense of distribution, and we can save babies' eyes at the rate of two for a cent. Compare this insignificant sum with the cost of blindness. It would cost twenty-five thousand dollars a year to save the eyesight of the two million babies born each year in this country, as against the twenty-five million dollars to educate and maintain those who have lost their eyesight through carelessness and neglect.

What the State Can Do to Prevent Blindness.

Dr. Willis O. Nance said that it is a shame that the example set by Illinois five decades ago in establishing an institution having for its object the worthy aim of preventing its indigent citizens from becoming blind or deaf has not, except in a very few instances, been followed by other commonwealths. The number of citizens who owe their useful vision to the care of this institution must number in the thousands.

Illinois, for more than a decade, has had a law on its statute books requiring that midwives report within twenty-four hours all cases of "babies' sore eyes." The penalty for non-

compliance with the provisions of this statute is a maximum fine of \$100 or six months' imprisonment, or both. It is possible that the existence of this law has been the means of saving some infants' eyes, but every oculist in Chicago knows that the statute is not enforced to the extent that it should be.

Chicago has an ordinance requiring that physicians, midwives, or other attendants, report every case of ophthalmia neonatorum to the Department of Health within twenty-four hours after its occurrence.

Strict enforcement of these two laws would, Dr. Nance believes, accomplish much in the prevention of blindness in our community.

The state might also with propriety go back even farther than the conscientious enforcement of the midwife notification law. It might with decided advantage make much higher the requirements for the practice of midwifery in Illinois. It might also require that midwives employ the Credé prophylactic method at every birth, as is done in some states.

The Chicago ordinance requiring that all cases of ophthalmia neonatorum be reported to the Health Department might well be made a state law. State legislation requiring report of all births, with the information as to whether prophylactic drops were employed or not, and, "If not, why?" might well be adopted. It might be well to have printed instructions for the care of babies' eyes, printed, as occasion demanded, in various languages and circulated in the homes.

Free distribution of nitrate of silver drops by the state should be encouraged. In at least one state, the speaker has been told, these ampules of silver are sent to every practicing physician and midwife, irrespective of request. They are inexpensive and a comparatively small appropriation is necessary to provide every person who performs obstetric work with them.

Ample hospital service for the treatment of cases of ophthalmia occurring among the needy should be provided by the state. Illinois, through her state infirmary, has done better for these cases than have most of the states of the Union. A training school for nurses with a course extending over a period of several weeks or months might well be established and maintained at the state infirmary in this city.

Trachoma, responsible for about one-tenth of all blindness

in Illinois, must also be reckoned with by the state. This means more adequate enforcement of laws affecting the sanitation of houses, institutions, etc. The ordinance prohibiting the common towel in public places, passed by the Chicago City Council at the instance of the speaker, might with equal value be made effective throughout the state.

Ocular injuries are responsible for perhaps five per cent of blindness. The greater number of these injuries are preventable, many of them being due to carelessness and ignorance.

The explosive golf ball has entered the realm of sight destroyers to quite an extent the past few years.

Industrial injuries do not seem to be occurring with the same degree of frequency that they did in the past. Manufacturers and railroad officials are furnishing much better means of protection for their employees than formerly. In this connection, however, the state might well attempt to prevent the removal of foreign bodies from the eye of workmen and others by nonmedical men. Every oculist of experience has seen the dire results following this practice.

Blindness from wood alcohol has become of sufficiently frequent occurrence to demand better regulation for its use in industrial pursuits and in its sale to the public.

The state can accomplish much in preventing defective vision and blindness on the part of its citizens by improvement in the school system, so far as it relates to the illumination of school rooms, the size and position of desks and seats, the size and character of the print of books, the kind of paper used, etc. The state might with prudent propriety demand that school superintendents, principals and even teachers have some knowledge of physiologic optics, the effects of poor illumination, etc., before they are permitted to qualify for their positions under the law. The state can do much to prevent blindness, but it cannot be expected to shoulder the entire work and responsibility. Through its various institutions and officials it can do much to spread the gospel of education—a decidedly potent factor in the propaganda we are promoting, especially at this meeting. Through its law making bodies and executive departments it can assist materially.

PAUL GUILFORD,
Secretary.

OPHTHALMIC SECTION,
ST. LOUIS MEDICAL SOCIETY.

Meeting of May 6, 1914.

Enucleation in Hemophilia.

Dr. John Green Jr.: L. O. L., age thirty-three years, came under observation November 25, 1912. At the age of eighteen years, the left eye had been struck by the head of a tenpenny nail. The eye was red for a time, but soon cleared and quieted. However, vision slowly failed to practical blindness. The eye remained perfectly quiet until five years ago, when he began to have attacks of redness associated with deep, aching pain. Each attack lasted from one to two days, and was thought to be accompanied by "hardening of the eyeball." He was under the care of several oculists, one of whom evidently suspected the presence of a foreign body, as he proposed enucleation. No X-ray, however, was taken.

Complaint: Recurrent attacks of pain, left, accompanied by photophobia right. Examination: A small, round, reactionless pupil, a very deep anterior chamber and a tremulous iris of a brownish red tint, suggestive of siderosis. Moderate ciliary congestion, no pain on pressure. Ophthalmoscope: Right eye, normal; left eye, aphakia, very faint view of disc (cloudy vitreous). Left eye, vision 1/25; with + 10 sph., vision 5/25.

Right pupil failed to react to light, though reacting well to accommodation. Inquiry into the general medical history elicited the fact that the patient had acquired syphilis ten years before, and that fact, together with absent knee jerk and slight Rombergism, indicated an early tabetic process. Wassermann four plus.

X-ray examination disclosed the presence of a fairly large foreign body, localized in the vicinity of the nerve head. An attempt was made to dislodge the fragment by means of the giant magnet without incising the eyeball. An X-ray, taken immediately after this attempt, indicated that the foreign body had not been stirred one iota from its original bed. Euclea-

tion was then proposed and accepted. The operation progressed without incident until the moment of cutting the nerve, when a copious hemorrhage occurred, which pushed the globe in front of the palpebral aperture. During the few moments required to sever the remaining shreds of tissue adherent to the globe, the loose connective tissue of the lids rapidly filled up with blood so that they became almost board-like. In the meantime a fat hernia had protruded itself between the lids and could not be reduced by pressure. Hot bichlorid compresses were applied. After fifteen minutes, the hemorrhage having practically ceased, I was able fairly to approximate the conjunctiva with three interrupted sutures. However, there remained this herniated mass outside the lids. A pad copiously smeared with vaselin was applied to the lids and herniated mass, and a pressure bandage applied. The following morning I found the dressings saturated with blood, and on removing them blood continued to ooze, drop by drop, from the herniated mass, which was about the size of a small hen's egg. Dressings were reapplied, with pressure. In the afternoon the bandage was again blood-soaked. I then began to suspect that I was dealing with a bleeder, and got him to admit that he always bled very freely after trivial injuries. For instance, he would bleed fifteen to thirty minutes after nicking his face in shaving. He did not know of any bleeders in his immediate ancestry. I then injected ten cubic centimeters of normal serum, and a few hours later a similar quantity. Within twelve hours oozing ceased and recovery took place without further hemorrhage. The herniated mass gradually receded, and at the time of his departure to his home in Memphis, on December 18th, he was able to wear a small shell eye. At this time there was a complete ptosis, which I presume was caused by pressure of the densely infiltrated orbital tissue on the branch of the third nerve which innervates the levator.

I was somewhat fearful lest the levator paralysis might be permanent, and so asked Dr. E. C. Ellett, of Memphis, to seek an interview with the patient and report his condition. Dr. Ellett kindly consented and saw Mr. L. on November 3, 1913. Dr. Ellett writes: "Replying to your note of the 30th, I called up Mr. L., and he came by the office this afternoon. I am glad to be able to tell you that he seems to be all right

in every way. Power has returned to the lid, and the only thing that troubles him now is the discharge from the socket. I suggested to him that if he would try a Snellen eye instead of the eye shell that he is wearing, he might find it would help this trouble."

In view of the fact that enucleation is an operation in which fairly large vessels and a great many capillaries are divided, and in which our resources for controlling hemorrhage are limited, it would be well to make it a practice to inquire of every patient upon whom we propose to remove an eyeball, whether or not he is a bleeder. If there are any reasons for suspecting the presence of hemophilia, it would be well to guard against a possible hemorrhage by the prophylactic injection of normal serum. This procedure is harmless, has been used with success in general surgical work, and would probably avert the disconcerting occurrence here described.

Discussion.—Dr. W. F. Hardy: I saw in the general literature an instance where a physician was confronted with a hemorrhage and was unable to stop it, and he conceived the idea of cutting his own finger and letting the blood drop on the bleeding area, in that way controlling the hemorrhage.

I had a case in a man almost parallel to this, but he did not give the history of being a bleeder. Before the eye was completely removed there was a tremendous puffiness of the tissues which impeded the removal of the eye, and by the time the eye was out there was a protrusion as big as a small egg. One could not see any lids, for they were completely hidden, but the bleeding at that time was not so very great. About two days after, the whole side of his face was black and blue from the blood seeping down between the tissues. I applied a bichlorid dressing, and the condition slowly subsided. I was convinced at the time that the cause of the trouble was the prolapse of fat. Evidently, I had cut into orbital fat with the scissors, so that it protruded, and the effect was accentuated by the hemorrhage that occurred.

Dr. John Green: Some laryngologists, prior to operation on tonsils, are at pains to determine the coagulation time of the blood. They operate in an area in which hemorrhage is with difficulty controlled, and hence try to guard against this complication. Might we not, prior to enucleation, with advantage copy this procedure?

Removal of an Anteriorly Dislocated Lens With an Ewing Keratome.

Dr. John Green, Jr.: Removal of a lens dislocated into the anterior chamber is an operation which the surgeon is apt to approach with some misgivings. Invariably the zonule is ruptured in whole or in part, and hence once the globe is opened there is no barrier to the tendency of the vitreous to press forward. If the attempt be made to extract the lens in the ordinary fashion, that is, by pressure on the cornea following an upward section, one is likely to lose vitreous even before the lens presents. Following this accident there is a tendency for the lens to drop back, or if this does not occur, its delivery can only be effected by means of a hook or loop, thereby inviting a further spilling of vitreous.

Beard¹ advocates dispensing with the speculum, fixing the globe by grasping the tendon of the superior rectus (Angelucci fixation), making an upward section, and then extracting with a hook passed behind the lens and "dug" into it. In this manner he succeeded in extracting a large, slightly luxated Morgagnian cataract without loss of vitreous. The grip on the superior rectus served to hold back the upper lid, absolutely prevented upward rolling of the globe and caused strong tendency to closing of the wound. Fixation of the lens, by means of a Bowman's needle passed into or behind it, preliminary to making the upward section, has many supporters.

Cellen² advocates a Lebrun section, depressing the handle of the knife so that the blade passes through the soft cortex in front of the nucleus, then elevating the handle and completing the section. Loop or spoon extraction.

Beard³ states that "Beer, in Vienna, at the close of the sixteenth century, tried plunging the lance knife, with which he made the corneal incision, into the lens, mobilizing the latter, completing the section, then expelling the lens by pressure. Often, however, the cataract came out with the knife."

Dr. A. E. Ewing⁴ suggested the use of the broad keratome (which he has used so successfully in cataract work) as an efficient instrument in handling this type of case. In Dr. Ewing's patient a congenital ectopic lens had become wedged

1. Ophthalmic Surgery. Second edition, p. 564.

2. Wood's System of Ophthalmic Operations, p. 1310.

3. Ophthalmic Surgery. Second edition, p. 567.

4. American Journal of Ophthalmology, October, 1911.

in the outer part of the anterior chamber, accompanied by increased tension and pain. Steadying the globe with double fixation forceps, a keratome incision was made in the temporal sclerocorneal margin and the blade passed back of the lens. The fixation forceps being exchanged for a Daviel spoon, pressure was made backward on the nasal portion of the cornea as the knife was slowly withdrawn. A hard, black nucleus came out with the receding knife, followed by a moderate gush of aqueous and bloody vitreous. Recovery, with vision 20/120, the same as previous to the glaucomatous attack.

My case is that of J. A., aged sixty-two years, first seen March 16, 1914. Three and one-half weeks before coming under observation the left eye and eyebrow was hit by a fragment of wood struck off by a hatchet. The patient was at first under the care of a general practitioner, who used cocaine and atropin. A greatly swollen, cataractous lens almost completely filled the anterior chamber. A narrow ring of iris was to be seen wedged between the lens periphery and the back of the cornea. At the upper outer part of the chamber the plane of the iris appeared to be slightly posterior to that of Descemet's membrane. By focal illumination it was possible to make out the outline of a fair sized nucleus. Tonometer: Right, 18 mm. Hg.; left, 25 mm. Hg. Right, vision, 6/12 1.25 0/5. Left, vision, fingers at six inches. In conference with Dr. Ewing, who kindly saw the patient with me, it was decided to pass the keratome into the lens behind the nucleus and by pressure on the cornea below endeavor to slide the lens out on the surface of the receding keratome blade. Operation at the hospital, Dr. Hardy assisting. The double fixation forceps, handled by the assistant, grasped the conjunctiva on either side of the cornea, the operator holding a Daviel spoon in the left hand and Ewing's keratome in the right. The incision was made at the upper sclerocorneal margin, the point being directed backward so as to pass posterior to the nucleus. The keratome was advanced until the rounded heel coincided with the sclerocorneal junction. As soon as this was accomplished, pressure was made on the lower part of the cornea and the keratome very slowly withdrawn. A good deal of soft cortex immediately presented. When the keratome was about half way out a small nucleus appeared, followed by more cortex. The iris prolapsed, but almost imme-

diately receded. Pupil nearly round and black. No loss of vitreous. One month after operation the iris had become adherent throughout its entire extent to the back of the cornea, and the nasal fibers appeared to be atrophic. Anterior capsule remains were attached to the posterior surface of the cornea. The deeper layers of the cornea contained here and there fine spots of infiltration. Right tension, 18 mm. Hg.; left tension, 8 mm. Hg. Left vision, + 10, 1/40. Ophthalmoscopically, faint view of the disc through the membranous opacity. I presume that prolonged contact of cornea and iris through the forward pressure of the lens led to inflammatory adhesion, and that the capsule became attached to Descemet's membrane through a similar process.

Discussion.—Dr. W. F. Hardy: I remember that I saw for Dr. Charles last summer a girl with congenital dislocated lenses. One lens was dislocated in the anterior chamber, but she did not want any operative procedure done. The pupil was dilated with homatropin. She was put in a reclining position, and the lens dropped back through the pupil. The pupil was then contracted with eserin. That is the last I have heard of her. I suppose she is all right. I have had no operative experience with these cases.

Dr. John Green: My experience in this single case leads me to believe that Dr. Ewing has suggested a valuable procedure. The operation is not difficult; it is simply a question of passing your keratome blade back of the nucleus to furnish a support for the lens. The keratome is slowly withdrawn and at the same time pressure is made on the lower part of the cornea: in all likelihood the nucleus will come out with the receding blade. The keratome blade does act as a distinct barrier to the advance of the vitreous, whereas all the other methods that have been suggested do not at all effectively hold back the vitreous. I am very sorry that Dr. Ewing is not here tonight. I should like to hear what his views are on the subject.

Removal of Globe After Sclerocorneal Trephining—Clinical Report and Microscopic Findings.

Dr. John Green, Jr., and Dr. Wm. F. Hardy: Clinical Report.—Mrs. M. L. L., aged fifty-nine years, came under observation January 20, 1911.

Ocular History.—Smoky vision of the left eye was first observed five years ago. Sight in this eye gradually failed to blindness accompanied by an occasional heavy ache, but no true pain. In the right eye vision had been misty for several months. Right vision, 2.5 ex. $45\frac{5}{8}$. Left vision, faint perception of light. Ophthalmoscopically, both discs showed typical glaucomatous cups, the right 3 D., the left 6 D. in depth. Tension in both. The right field was markedly contracted nasally, especially in the horizontal meridian. The patient was carried along from January 20, 1911, to July 2, 1913, with no diminution in central vision and only moderate further contraction of the field. Treatment consisted of eserine salicylate, pilocarpine muriate, and a carefully regulated regime. In July, 1913, patient went to Los Angeles and was not seen again until January 16, 1914. On her own initiative, she had abandoned local treatment since August. Right eye, vision 6/10; left eye, blind. Several weeks ago the left eye began to be painful and presented all the signs of a sub-acute attack of glaucoma. Right tension, 36 mm.; left tension, 72 mm. Hg. Blood pressure, 195 mm. Hg. Urinalysis showed sugar. On January 20th, left eye was trephined according to Elliot's method. The usual conjunctival flap was laid down over the cornea, which was split with some difficulty. The two millimeter trephine, which proved to be rather dull, finally cut through the sclerocornea, the division of the deeper layers being accomplished with some difficulty. There was no immediate prolapse of the iris, but on lifting up the plaque with forceps a small peripheral prolapse took place. This was excised, and an attempt was made to wash the iris into position with the irrigator. Almost immediately after the peripheral iridectomy there was an appearance of blood in the anterior chamber. It was, therefore, impossible to determine whether the irrigation had washed the iris back into position. The conjunctival flap was replaced, and one suture inserted near the apex. After the operation the eyeball felt very hard; in fact, if anything, tension was higher than before, so that I immediately suspected not only a hemorrhage from the iris, but a deep one as well. The patient experienced a great deal of pain for the first four or five days. The blood in the anterior chamber slowly resorbed, revealing the fact that the iris was adherent at several points to the

anterior capsule of the lens. I hesitated to use a mydriatic, in view of the increased tension, but did so, nevertheless, feeling that I must endeavor to rupture the synechiæ if possible. The patient made a very tedious recovery, and when she left the hospital a month later the eye was still very red and irritable. It was then observed that the lens was becoming opaque. In the meantime tension, which at first was decidedly high, had gradually dropped to normal, but there did not appear to be any filtration through the sclerocorneal opening. On March 10th I noticed a slight hypopyon, which on the following day had increased to one-fourth the height of the chamber. No evidence of infection at site of trephining. The condition went from bad to worse, and on the 13th chemosis and increased pain indicated an impending panophthalmitis. Removal of the globe was therefore advised and performed the same afternoon.

I cannot blame myself with any special clumsiness in the performance of the trephining, although, no doubt, the technic would have been smoother had the trephine been sharper. It is possible that, as indicated by the specimen, the trephine blade came in contact with the lens periphery, thereby leading to the development of a traumatic cataract.

Microscopic Findings.—The bisected eye macroscopically showed a cataractous lens displaced upwards, impinging on the trephined area. The iris was pressed against the cornea, no anterior chamber being present. The iris tissue prolapsed into the trephine opening was attenuated. The vitreous was filled with a grumous mass, the anterior part showing a purulent character, the posterior, bloody. There had evidently been a large, deep intraocular hemorrhage. Microscopically the prolapsed iris was represented chiefly by its pigment layer, the stroma having atrophied. The capsule of the lens was ruptured at its superior aspect, and the corresponding part of the lens substance was infiltrated with round cells. Other portions of the lens showed areas of round cell infiltration lying in layers between the lens substance. The hiatus in the lens capsule must have been brought about by the trephine. The trephine opening was filled with connective tissue, round cell exudate, blood, iris pigment and epithelium, the latter a downgrowth from the bulbar conjunctiva. In some sections the epithelium appeared as a teat-like prolongation,

in others as islands or plugs of solid epithelium. Anterior and posterior to the iris tissue outside the operative area were small collections of red blood corpuscles. Between the anterior lens and the iris the space was filled with an aggregation of round cells. In some areas the pigment layer of the iris was separated from the stroma by hemorrhage. The ciliary body in the region of the trephine opening was densely packed with leucocytes. Good sections of the optic nerve were not obtained; those we had showed the optic nerve cup filled with exudate. The lens capsule where ruptured was thrown into folds, the free ends reaching up to the opening in the sclerocornea. The abrupt ending of the lens capsule, Descemet's and Bowman's membrane were apparent; the appearance of the cornea and Bowman's membrane gave one the impression that the splitting of the cornea was not deep or extensive. The microphotograph made by Dr. Alt shows very clearly the pathologic condition.

Discussion.—Dr. John Green: Dr. Woodruff, I would like to hear from you in regard to a case that I saw you do at the Deaconess Hospital, about the middle of November. What was the final outcome?

Dr. Woodruff: The same that you report. I cannot give you the details, because I do not remember them exactly, but this woman had no light perception at all. She was suffering with pain at the time that she came to me, and the only reason for doing the operation at all was the hope of relieving pain. She was distinctly told that there was no possibility of recovering any lost sight. The trephining was done with a two millimeter trephine, and everything went along smoothly for four or five days. Suddenly, she developed great pain and tenderness, increasing tension, indicative of an intraocular hemorrhage. The pain became so intense that I removed the globe, and found an intraocular hemorrhage. I will say that she had a glaucoma in the other eye. I had not seen her for some time until about a week ago, when she came in. This was done about the last of October, and she did not consult me until a few days ago, when she came to me on account of **some other trouble.**

Report of a Traumatic Paralysis of Both External Recti.*

FREDERICK E. WOODRUFF, M. D.

DISCUSSION.

Dr. Green: What has been the treatment?

Dr. Woodruff: Nothing except glasses to correct some of the hypermetropia, so as to avoid as much convergence as possible, thinking that by putting the accommodation at rest there would be less effort at convergence. I expect to increase that correction as soon as I can, but this accident happened only the last of March, so I have hardly had time to do very much.

Dr. Green: Did I understand you to say that the outward motion in one eye was somewhat better than at first?

Dr. Woodruff: Yes, it is decidedly better. He can move the eye beyond the median line; that is, the left eye. Up to a few days ago, he was unable to move the right eye beyond the median line.

Dr. Green: I do not know the literature of that bilateral abducens palsy. Are there any cases in which it has been determined that a hemorrhage was the cause—a hemorrhage of the base?

Dr. Woodruff: I could not find any. All that I can find seem to support the idea that there must be a fracture at the base without any other symptoms. I did not see the child for ten days after the injury, but I was told by a competent surgeon who was the attendant that there was no sign of fracture so far as he could determine.

Dr. Green: Was there no X-ray taken?

Dr. Woodruff: No, there was not.

Dr. Hardy: You say he had two diopters of hypermetropia, and you gave him a correction of one diopter. Why did you not give him a full correction?

Dr. Woodruff: He is a little chap, four and a half years old, and very restless. It was with difficulty that I got the two, and at the first sitting that was the best I could do. I thought I would give him the one, and try him again a little later. (Ten days after the above report the patient was again seen, and there is a decided improvement in the muscular action. It is now possible to rotate both eyes at will. The convergence is lessened. When I found that the left externus had begun

*See page 654.

functionating, atropin was used in that eye in order to force the use of the right eye.)

Dr. Frederick E. Woodruff, closing the discussion: The prognosis in these cases is, as a rule, I believe, very uncertain. Some improve and get well, and others do not. This has had a special interest to me, for about two weeks later, on the 24th of April, a man came in with a paralysis of one external rectus, and reported having had a facial paralysis at the time that the eye trouble began. The facial paralysis has entirely disappeared, leaving a paralysis of the external rectus. He reports that in December, 1913, he had had a cold and took one capsule of quinin—he does not know how many grains, simply one capsule of quinin—and then went out and got wet. He was riding horseback, and about an hour and a half after taking the quinin he noticed that something was wrong with his sight. The next morning he began seeing double, and after about a week the eye squinted considerably. He attributed that to the quinin, but on questioning him I found that he had taken quinin previously without bad effects, and I took it that it was one of those cases of paralysis due to exposure, in which the facial and the sixth nerves are both involved, and the facial recovers before the external rectus. I found that he had one and one-fourth diopters of hypermetropia, which I corrected. As to the outcome, of course, I can say nothing, for that was only on the 24th of April.

Dr. Green: In this case of the little boy, doctor, are there now any symptoms referable to his injury other than the ocular?

Dr. Woodruff: Absolutely none; there never have been, except for the first three or four days.

Dr. Green: And what were they?

Dr. Woodruff: He was semiconscious, and would rouse and talk at random and be very drowsy, but since I have seen him, ten days after injury, there has been nothing. He seems a normal child, with no signs of where he struck, except a little contusion on one shoulder and a slight abrasion of the side of the nose.

PHILADELPHIA POLYCLINIC SOCIETY.

Meeting held April 9, 1914.

Reports of Serious Ocular Conditions Due to Dental Diseases.

Dr. William Campbell Posey reported two cases of ocular trouble in which the causal agent had apparently been an affection of the teeth. The first, one of monocular retrobulbar neuritis, occurred in a young woman, twenty-five years of age, who had recently had the roots of the left lateral and central incisors crowned to repair the deformity occasioned by breaking off the bodies of the teeth in consequence of an accident. The nerves of the affected teeth had been carefully removed and the roots filled antiseptically. The ocular symptoms had appeared after an automobile ride in a sharp wind, and were thought by Dr. Posey to have been occasioned by a retrobulbar involvement of the nerve in consequence of a periosteal inflammation emanating from the affected teeth. Other possible causal conditions were absent. Vision was reduced to counting fingers at one meter eccentrically, the reduction being due to a large absolute central scotoma. The temporal half of the disc was somewhat pale and retinal veins were full. There was no neuritis. The fellow eye was normal. Rapid restoration of vision followed pilocarpin sweats, salicylate of soda internally and a blister applied to the temple of the affected side. Some dental applications were also made to the gums about the affected teeth. The patient passed from under observation at the end of a month, vision having been restored to normal and all symptoms having subsided.

The second case occurred also in a young woman, and consisted of a detachment of the retina in the left eye, which was apparently due to a long standing abscess at the root of an upper incisor upon the same side. The removal of the tooth caused the prompt disappearance of the sac, which had been palpable at the root of the tooth for several years previously, but brought no relief to the ocular condition, nor indeed did tapping the retina or prolonged rest in bed and the usual remedies ameliorate the ocular condition, the detachment still persisting as before.

Dr. Posey referred to the many ocular disorders reported in the literature apparently due to dental affections, at times in consequence of irritation of the terminal filaments of the fifth nerve, but often purely neurotic manifestations entirely coincidental and without the relation of cause and effect. Bruner's recent paper upon the relation of the teeth to the eyes was referred to at length, and attention called to Lang's observation that in two hundred and fifteen cases of ocular disease observed by him which could be attributed to sepsis, pyorrhea was the sublying cause in one hundred and thirty-nine instances.

Discussion.—Dr. Leighton F. Appleman reported a case under observation for the last three weeks of a man who suffered a rather sudden reduction in sight of the right eye. Haziness of the retina with dilatation of the lower temporal vein, exudation and hemorrhage along it. Later the superior vessels were involved, with hemorrhages in the retina, giving a picture of thrombosis. No history of lues or other constitutional disease could be elicited. Treated in the hospital, given sweats, with inunctions of mercury daily. Improvement seemed rather tardy. It developed later that he had been struck on the upper central incisors with a ball, about five months previously, and that an abscess formed at the root of the left incisor, for which he had received treatment a short time after the injury. He was referred to a dentist, who found an abscess at the root of the right incisor, which was drained and treated.

Following this, improvement in the condition of his eye ground seemed to be more rapid, and it seemed fair to assume that the dental abscess was the cause of this ocular condition.

Dr. Wendell Reber referred to three cases of serious ocular conditions due to dental diseases, all reported in the *Dental Brief* for June, 1904, which were proved to be of dental origin.

Spontaneous Absorption of the Crystalline Lens.

Dr. William Zentmayer: The group of cases of spontaneous absorption of the crystalline lens here related is of interest, as it contains cases representative of the different conditions which may give rise to the antecedent dislocation of the lens. In all four instances the absorption occurred without the pro-

duction of secondary glaucoma or an irritative iridocyclitis, and in all but one useful vision was restored.

Spontaneous absorption of the lens rarely occurs with the lens in its normal position, or without a rent occurring in its capsule. Dislocation of the lens, either into the anterior chamber or into the vitreous, is usual. Such dislocation follows a weakening of the suspensory ligament of the lens through disease of the vitreous secondary to a choroiditis or cyclitis, progressive myopia or distension of the globe in hydrophthalmos. Atypical development of the zonule is the cause of congenital dislocation of the lens. Blows upon the eye often dislocate the lens, which may later undergo absorption, but such cases are not "spontaneous."

The cases here reported illustrate rupture of the capsule from congenital anomalies, weakening of the zonule from congenital glaucoma, and during the development of hypermature cataract. In the last variety there is often a contributing cause in an associated choroiditis and jarring of the body in coughing or jumping, or perhaps a blow upon the eye so slight that it went unnoticed by the patient. At this time I shall not give details of the cases, but mention only the important points in the history bearing upon the subject under discussion.

The first case was one of unusual interest aside from the condition under consideration. In April, 1894, a child twenty-one months old was brought to my office because of a cast in its eye and of the so-called amaurotic cat's eye appearance. The right eye was turned slightly up and strongly in, the pupil was semidilated. At the posterior pole of the lens there was an oval greenish reflecting opacity. This occupied but part of the pupillary area, and through the clear periphery of the lens a prolongation backwards of a cord of white tissue could be made out. In the middle of this there was a red streak, probably the hyaloid artery still blood bearing.

Two and one-half years later there had been no change other than the development of a stronger degree of convergent squint. Five years from the time of the first visit he returned with laminated opacities in the posterior layers of the lens, which later became a total cataract. Four years from this date he returned with absorption of the lenticular substance and a thickened capsule, with a large rent in the anterior cap-

sule. Through this there could be seen attached by the capsule remnants by a base of about two millimeters a freely moving hyaloid sheath, constricted for a short distance, then flaring out as it approached the disc so as to hide all but its upper inner segment. As the membrane approached the lens it was seen to bifurcate, one band going to the posterior capsule, the other turned nasalward and traceable to the region of the ora serrata. There was an area of choroidal atrophy, possibly an incomplete coloboma, at the lower border of the disc. H. = 9 D. V. = L. P. The other eye showed no anomalies.

The development of cataract in this case may have been due to the traction of the hyaloid structure upon the capsule of the lens, and the subsequent absorption may have been due to rupture of the capsule from the same cause.

The second case was one which because of other features was remarkable. A man forty-seven years of age had a high degree of hydrophthalmos in the right eye. The left eye had been recently removed for absolute glaucoma. Twelve years before he had been told that he had a cataract in the right eye. Vision became reduced to light perception. Some years later vision was suddenly, in part, restored to it. The eye presents all the features of congenital glaucoma with aphakia. While the haze of the cornea prevents an accurate view of the interior of the eye, still not even a trace of the lens could be found. Vision with + 13 D. = 20/30 pt. Tension equaled minus 90 mm. An Elliot operation was performed, reducing the tension to 10 mm. one month after the operation.

The third case was that of a compositor who came for treatment of a severe iritis in the right eye. He said that he had lost the vision of the left eye from cataract many years before, and had been advised to have the cataract removed, but that he never had had the operation performed. He believes, however, that the sight has improved somewhat. Examination showed an aphakic eye with no trace of the lens. Vision with + 11 D. = 16/10. The right eye was almost blind from a plastic iritis.

The fourth case was one in which Dr. Zentmayer had performed a successful cataract extraction upon the right eye some years ago. The fellow eye at that time showed a cataract somewhat hypermature. Two years later the patient returned, stating that the eye operated upon had gradually

gone blind, but that the unoperated eye had much improved. In the operated eye there was a complete glaucoma, and in the left the lens had disappeared, but there were a great many coarse opacities well forward in the vitreous. With the proper lens visual acuity was almost normal.

Discussion.—Dr. Posey said that the remarkable restoration of sight in those formerly blind could usually be accounted for by the cataractous lens slipping from its position in the pupillary axis into the vitreous. While, as Dr. Zentmayer had pointed out, the lens in such cases becomes absorbed, it more often happened that this did not occur, but that the lens mass remained and gave rise to irritation of the ciliary body. If absorption of the lens could be relied upon, the desirability of removal of dislocated cataractous lenses would not so often come into question.

W. WALTER WATSON,
Secretary.

WILLS HOSPITAL, OPHTHALMIC SOCIETY.

Regular Meeting, April 7, 1914.

Plastic Operation for Cicatricial Ectropion of the Lower Lid.

Dr. P. N. K. Schwenk exhibited a boy who, when quite a child, had an abscess of the orbit, producing a contraction of the lower lid—a condition of so-called ectropion. He was not able to close the eye completely, and the eyeball was thus exposed to irritation; so the idea of doing a plastic operation was conceived. The question then arose as to the choice of a place from which to take the flap. The first thing to get rid of was the cicatrix, which fastened the cartilage of the lower lid to the lower rim of the orbit. It was necessary to cut out all of the cicatrix, merely saving the ciliary border of the lid. An incision was then made directly out from the external canthus, sickle-shaped, so that the curve of the flap would fit into the curve of the lower lid. Of course, it was necessary to turn the flap, and doing this made quite a fold of tissue. The size of the flap in such cases should be 33 per cent larger than the denuded area, or even twice as large, to allow for shrinkage.

After the part had been denuded and the flap placed in position, the edges were united with a number of sutures and the flap brought into position. The denuded part on the temple was then undermined and the surfaces brought together. This produced some tension.

The lesson to be learned from this operation is, in the first place, that the conjunctiva was not loosened deeply enough in the orbit: because some contraction has taken place, which has pulled back the lid, although not quite to the same extent as it was before. Dr. Schwenk believed that the operation would have been more successful had he cut the external ligament and sutured the lid to the brow, so as to hold up the lower lid until union took place. Another time he will unite the flap to the lid by stitches passing through the skin and the conjunctiva, so as to keep the surfaces in direct apposition.

The operation was done on the 17th of March, and the patient got homesick and left the hospital too soon, so that

continuous pressure was taken off. This should be maintained until after the stitches are removed, at least. A correction can be made after contraction has taken place. It is astonishing how much these grafts or flaps contract after operation.

Discussion.—Dr. Posey, while complimenting Dr. Schwenk on the excellent results obtained from his procedure, thought that scarring would have been less had the usual method applicable to such cases been followed, and had the flap been taken from the temple and from above the brow. The resultant scar tissue then follows the natural lines of the face, and is often scarcely noticeable.

Dr. Zentmayer asked Dr. Schwenk to describe the details of the after-treatment. Some surgeons feel that the after-result is largely dependent on the way in which the cases are dressed, the subsequent applications, and the time of removing the sutures. Steps of that kind are of the utmost importance.

Dr. Schwenk thought the after-treatment a very important question, and believed that in this case the result would have been better had he been able to keep the boy in the hospital longer and continue the dressing as he had dressed it. He did not think anything was better for this purpose than cosmolin or albolen, and pressure. If there are any sore spots, he advocated using boroglycerid, applied to the denuded parts; but the continued application of cosmolin with pressure is simple, and nothing is equal to it. Cosmolin is an antiseptic; so that we can, without removing the stitches and the pressure, keep the flap in apposition, which is a very important thing.

Melanosarcoma of the Conjunctiva.

Dr. H. M. Becker stated that the boy exhibited by him was one whose history, obtained from his mother, contained the statement that when born he had a black speck on the conjunctiva, which persisted and gradually enlarged. It was permitted to run along until he was twelve years old, one year ago. He is thirteen now. At that time, on making an examination of the eye, a black pigment growth on the conjunctiva, towards the inner canthus of the right eye, was found. It was freely movable, and did not seem to be adherent to the sclera. There was a bunching of the pigment over the edge

of the cornea, with a sort of cystic appearance; but it did not appear to be a true cyst. It seemed to be more of a thickening of the episcleral and conjunctival structures.

Two rather long incisions in the conjunctiva were made: one, upward; and the other, downward. These incisions were made at an angle of almost sixty degrees from the horizontal, the apex being at the limbus. Under local anesthesia a dissection was made all the way back under the caruncle; and there is now very little retraction. It was thought that the growth had been completely removed, and the pathologist reported it to be a melanosarcoma.

About four or five months following the operation there was a recurrence of a little pigment deposit at the limbus; and about eight months after the operation there was a small deposit, the size of a millet seed, which can be seen one-quarter of an inch downward and inward from the limbus. Dr. Becker brought the patient before the society in order to get an opinion as to whether this is the recurrence of a malignant growth or of a nonmalignant growth. The pathologist reported a mixture of large and small round cells, but no giant cells. The blood vessels are rather large, and have not well formed walls. He did not commit himself positively, but said that the growth was probably a melanosarcoma.

Discussion.—Dr. Schwenk was reminded of a case that he had seen in 1891. The growth was removed, and found to be a dense melanosarcoma. The case remained in statu quo until 1901, when recurrent attacks came on quite frequently. The best results obtained were from the application of monochloracetic acid. Dr. Schwenk believed that it is dangerous to cut these cases, and prophesied enucleation for this ball if repeated cutting should be done. The case that he had under observation was enucleated in 1911, having been under observation for twenty years. It was questioned by Dr. Oliver whether it was a sarcomatous growth until the final result. Dr. Schwenk cautioned Dr. Becker that the less cutting done, the less recurrence would there be. He believed that there were tissues beyond the point of pigmentation containing sarcomatous cells that would become active sooner or later, although then in embryotic form; and that these would cause recurrent attacks.

Monocular Retrobulbar Neuritis From Ethmoiditis.

Dr. Posey referred to a case of monocular retrobulbar neuritis from ethmoiditis, under his care at the present time, in which vision was improved from 2/60 to normal after a week's treatment, directed to the underlying basal condition. He referred to Onodi's work in showing the connection between the sinuses and the optic nerve, and pointed out how the nerve might be just as readily affected in disease of the posterior ethmoidal cells as in sphenoiditis.

Congenital Atresia of the Lacrimal Duct.

Dr. Posey exhibited a case of congenital atresia of the lacrimal apparatus, in a young man in whom he had established lacrimal passages by the insertion of styles. Eighteen months had elapsed since the operation. The passage on the right side was quite patulous, the style having been removed a year previously. The style was still in situ on the left side, and was occasioning some little irritation and would have to be removed.

Complicated Cataract.

Dr. Posey showed a young woman with complicated cataract in the left eye, the opacity being secondary to uveal disease, the precise nature of which had not yet been determined; but it was probably due to intestinal intoxication.

Hemorrhagic Glaucoma.

Dr. Posey also exhibited a woman with hemorrhagic glaucoma in the right eye and a deep glaucoma cup in the left eye, which had been treated with atropin by a general practitioner, notwithstanding the stony hardness of the eyeball and the presence of blood in the anterior chamber. Dr. Posey would rely upon miotics to control the disease, and deprecated any form of operation in glaucoma with hemorrhages.

Complete Sclerosis of the Retinal Circulation.

Dr. William Zentmayer gave the notes of a case in which this condition was present, and showed a water color reproduction of the fundus.

O. B., male, aged thirty years, a driver, in the last stages of chronic interstitial nephritis, came to Wills Hospital on

March 10, 1914, complaining of failing vision in the left eye. This had come on three days before. He stated that the vision of the right eye had been lost some time between the age of five and ten years. He had a primary sore, with marked secondaries, in 1909. He has been married about a year and a half, and has a healthy child, ten months old. The urinalysis showed a specific gravity of 1012, four per cent of albumin, and numerous granular casts.

An ophthalmoscopic examination showed, in the right eye, a secondary posterior cortical cataract, somewhat obscuring the fundus. The papilla appears unusually large, chalky white, and filled in. The retinal vessels are converted into dead-white ribbons, tapering towards the periphery of the fundus. Only the main branches are visible, and these do not extend so far out on the retina as normally. Upon the papilla a hairline red reflex can be made out with difficulty in two of the branches. There are no other lesions in the fundus. The left eye presents the picture of a typical albuminuric neuroretinitis. There are numerous hemorrhages, white plaques, and marked papilledema.

While similar changes are not uncommon in sections of a vessel, or perhaps an entire branch, such complete obliterative endarteritis and perivasculitis is very rare. The cause is probably an obstruction to the central artery of the retina or syphilis.

A Case of Reversion to the Negro Type.

Dr. Frank Fisher presented a bright mulatto girl, nine years of age, exhibiting an irregularly egg-shaped area of absolutely black tissue, about $1\frac{1}{2} \times 2\frac{1}{2}$ inches in size, extending from the outer canthus of the left eye directly downward. The edge of each lid is also deeply pigmented, and this pigmentation extends for a quarter of an inch into the tarsal conjunctiva of each lid. The area on the cheek is very slightly elevated, and almost covered with a growth of very fine, very short, straight, black hair.

Dr. Fisher considered it a reversion to the original type. The changes were very peculiar, and he thought that the fact of its having a hairy growth on it was a pure coincidence. The possibility of bleaching it by means of carbon dioxide had been suggested, and Dr. Fisher thought that Dr. Picard would probably try that treatment.

Discussion.—Dr. Chance was inclined to regard it as a nevoid growth, as the sensation and touch were entirely different from that experienced in touching pigmented anomalies. A simple reversion would not necessarily be followed by such hairs as grow there, whereas melanotic or nevoid cases are frequently hairy.

Dr. Picard said that the cases which he had seen were rarely in colored persons. He agreed with Dr. Chance that it was a little thicker than a nevus; but said that very frequently the capillary dilatation and engorgement are responsible for that.

Dr. Ziegler suggested that fulguration might be of service in such a condition.

A Capsulomuscular Advancement Operation.*

Dr. Ziegler showed a case of advancement which he called a capsulomuscular advancement, with a partial resection of the muscle. He exhibited the case to show the final result, because the patient would soon leave the hospital. The muscles were in a straight line, and the muscular action was very good. Dr. Ziegler showed two drawings which partially illustrated the operation.

There are practically three stages to the operation. The first is the insertion of the anchoring suture in the muscle; the second is the passing back of the suture through the capsule; and the third is anchoring to the sclera in front.

Discussion.—Dr. Posey had done two of these operations: one, alone; and one with the aid of Dr. Ziegler. He was very well satisfied with the result, particularly in the case in which Dr. Ziegler helped. The result, however, was excellent in both cases. Dr. Posey considered it a very good and safe procedure.

Bilateral Optic Neuritis Due to Ethmoid Infection.

Dr. Heed recorded the case of a female, aged thirty-nine years, seen in October, 1913, when she had complained of blurred vision and vertigo. The ophthalmoscope disclosed a suspicious hyperemia of each disc. One week later the hyperemia was pronounced, but no other ocular signs of disease were elicited. The fields were normal. Vision in the right

*See page 633.

eye was 6/4; in the left, 6/6. The case was referred for examination of the accessory sinuses to Dr. L. J. Burns. Five days later the fundus picture presented a circumscribed neuritis with engorgement of the retinal veins, but no other peripheral changes were noted. The fields showed a contraction of thirty degrees, temporal; ten degrees, upper and lower; and five degrees, nasal. The contraction was practically the same in both eyes. There was a relative central scotoma of the left eye. Urinalysis and the Wassermann test were negative. Dr. Burns reported posterior ethmoid infection. The patient was admitted to the Polyclinic Hospital for active treatment. Upon her discharge, ten days later, the fields showed a very decided improvement. The vision in the right eye was 6/5; in the left, 6/10. The case illustrates the importance of repeated perimetric tests in accessory sinus infections.

Dr. Ziegler had seen a number of cases of monocular optic neuritis following ethmoiditis, but had never seen a double case; and for this reason he thought that Dr. Heed's case was exceptional.

J. MILTON GRISCOM,
Secretary.



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